



# AUGIWorld

The Official Publication of Autodesk User Group International

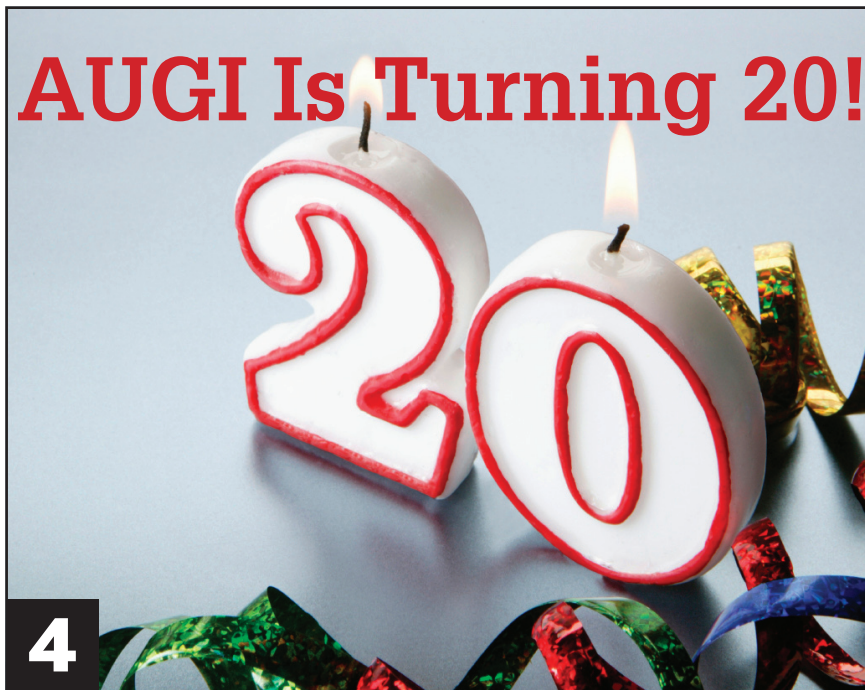
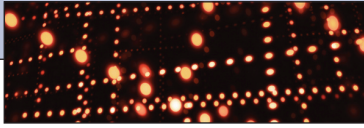
# AUGI Is Turning 20!

## Also Inside

- *Interviews with Lynn Allen and Donnia Tabor-Hanson*
- *Achieving the “Wow” Factor in Revit Structure Models*



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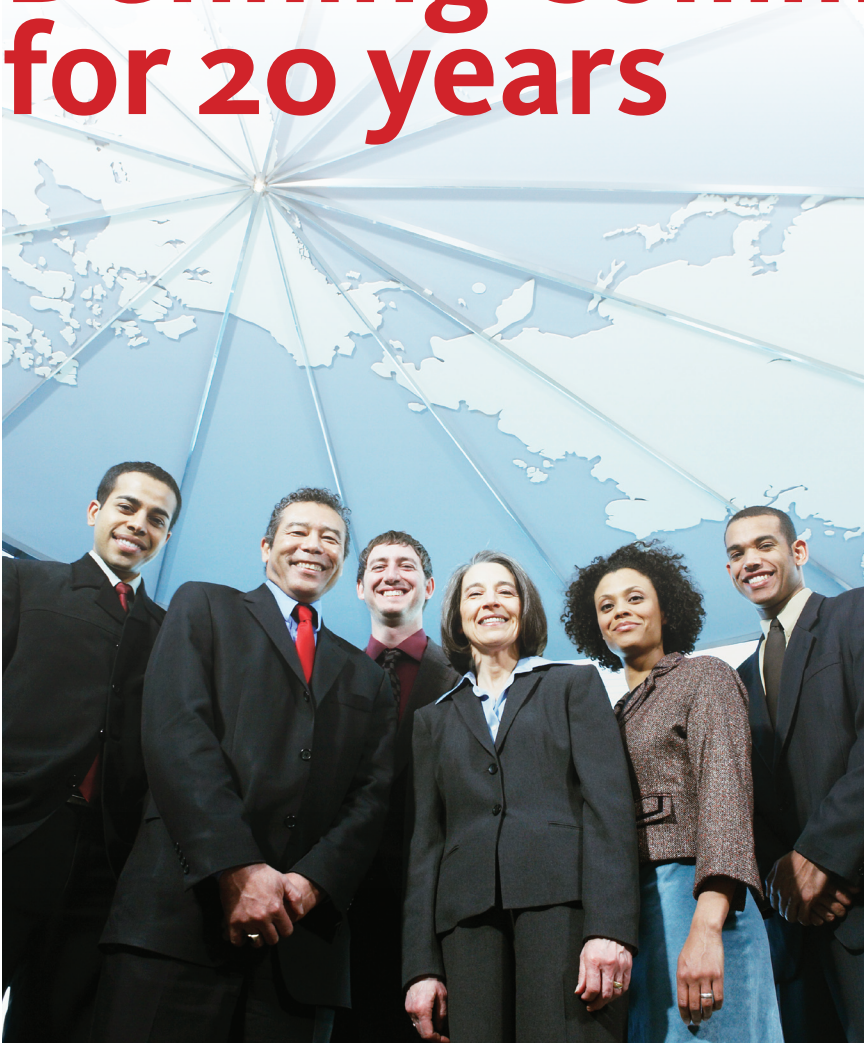
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## Defining Community – for 20 years



AUGI is turning 20 and we are going to celebrate with an entire year's worth of events, remembrances, information, highlights, and planning for the next 20 years.

If you have joined AUGI, you know that it is all about members helping members. You help others and others help you. Looking back, I am sure that you can think of times when someone helped you get past that system problem and get your work done. You can remember a time when you offered advice to others who had not uncovered the solution that you suggested. Good friends have grown from AUGI connections. Lifelong friendships have developed and blossomed (some even into marriages). Community is like that.

### What is Community?

There are many places you can go that

use the moniker "community." Organizations abound that strive to connect people to people under the umbrella of shared values. Definitions of community are almost as abundant as the groups that use them. Various components are connected and offered that appear to embody community.

So it may be good to let you know what AUGI views as community. What components are needed for community? What activities are needed for community to happen? When community is created, what does it look like?

We may not be in agreement with others' definitions and components of community. But we aren't here to offer the definitive outline of community; rather, we want to help you understand the flavor of community within AUGI.

We will look at three areas: Values, Definitions, and Components. Values are the foundation of our efforts. What we hold dear drives what we do. Definitions are just an attempt to clarify our wording. Components are the mix of events, offerings, and services we create.

Some groups may hold most or all of these same values; others may not hold any of them. Some may use differing definitions and offer various components. AUGI embraces any and all flavors of community.

Here are some values that AUGI holds as it relates to community. First let's start by defining what community is not.

### What AUGI believes community is not

**Community is not one size fits all.** Community develops inside culture. Culture can mean ethnicity, language, industry, or environment. Community may differ from one country to another, from one industry to another. There is no way that one program, method, or approach can include all persons. Therefore, AUGI allows for differentiation within its communities.

**Community is not just being on an email list, visiting a website, or downloading a document.** These may be a component of community, but joining an email list is not the full expression of community. These kinds of activities do not build relationships. AUGI believes that community will create relationships. Personal interaction between individuals and groups garners greater desire to interact. Therefore, AUGI will provide opportunities to interact. These may be web postings, face-to-face meetings, or virtual events. But they will all be two-way conversations.

**Community is not created externally.** Community is created and expanded by the community itself. No one can force anyone to join a group, participate in events, or share with others. It happens

naturally. Therefore, AUGI will respond to the way our members want to communicate and congregate. If they want to use the web, they can use the web. If they want to meet face to face, then they can join a local meeting. If they want to group themselves in differing ways, then AUGI needs to respond.

**Community is not constrained.** People will join and depart from groups as they see fit. People will “vote with their feet,” which means that they will come and go as they please. We have seen many online communities sites that rise up overnight and then months later their “community” moves on to the next greatest web tool. Therefore, AUGI will help facilitate community through web tools, but we understand that our members interact in other ways beyond the web. They may congregate on one or many sites beyond the AUGI reach and we understand that. We embrace AUGI members wherever and however they choose to interact.

## What is Community at AUGI?

The AUGI Board of Directors have created a Global Purpose statement.

### AUGI is...

*One vibrant global community that fosters collaboration to empower members and enrich knowledge of Autodesk solutions, advancing productivity and effectiveness, at a justifiable cost.*

Let’s unpack the above statement and outline what each word or phrase means within AUGI.

**“One”** reflects the fact that the overall community is a collective. It is a place where one voice can speak to many and many can speak to one. Through the process of survey and selection, the whole can speak as one as reflected by our Wish lists and Surveys. By speaking up in a forum or at an event, one voice may communicate to many. Individual members can choose from the wide range of offerings and select the method of communication. So AUGI will provide opportunities for individuals to be a part of a greater whole and for individuals to rise up in the community through volunteerism to servant leadership. Whether as an individual or as a Local Chapter or Country Chapter – we are all one AUGI.

**“Vibrant”** means that AUGI will always strive to be current and relevant as well as open and accepting. There is a desire to encourage active participation on all levels. Leadership roles are open to all. Discussions are moderated at times but always unfettered (apart from disrespectful and

inappropriate behavior). Interaction is encouraged between various subgroups. Ideas are exchanged in a professional environment of respectful understanding.

**“Global”** means that we are truly international. We have international representatives in leadership roles. We have international language-based interaction. We have international participants from more than 150 countries. We have members in just about every inhabitable location on the planet. From Argentina to Alaska. From South Africa to Russia. From down under to the top of the world. North, south, east, and west are all interrelating in our community.

**“Community”** means a group of people who form relationships by interacting

Whether as an individual or as a Local Chapter or Country Chapter – we are all one AUGI

regularly around shared goals, needs, and experiences, which are of interest to all of them for varying individual reasons. Some may interact in all areas and others may choose to limit interaction to one method. The member has the choice. The membership defines the community. It is not thrust upon them, created for them, or modified without regard to their needs and desires.

**“fosters collaboration”** displays our desire that members enjoy circumstances necessary for community involvement to seek answers together. Idea builds upon idea. Comment enhances comment. Collectively we achieve more than we can separately. We not only provision collaboration, we foster it. We develop community programs that engender working together. Above all, AUGI is a peer-to-peer group. Face-to-face meetings provide a solid local foundation for the services that the community enjoys. Fully involved members will avail themselves of online collaboration as well as face-to-face local meetings and regional training events.

**“empower members”** to expand their firm and career goals. It is all about the members. Personal enrichment and vibrant interaction at peer-to-peer, one-to-many, and many-to-many levels of interac-

tion allows the AUGI community to self develop skills and talents. Members can give, take, enhance, encourage, and support each other. Members can watch from the grandstands, cheer from the sidelines, coach from the bench, or get into the game – all at their discretion. AUGI enables all of it.

**“enrich knowledge of Autodesk solutions”** so that each members can seek out and share knowledge that, when cooperatively exchanged, enriches everyone. We focus on Autodesk solutions and the industries they serve. Product reviews, comments, critiques, and enhancement suggestions are all part of the communities efforts. The industries that are served by Autodesk will also be arenas for discussion in AUGI. By allowing collateral conversations apart from product-centric issues, our members will enhance the level of professionalism that they take away from AUGI encounters. It promotes bigger picture discussions that flow around the use of the products. As long as the focus includes the use of an Autodesk solution, the conversation will be encouraged.

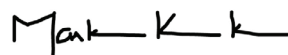
**“advancing productivity and effectiveness”** is the core of AUGI’s offerings. Most of our efforts will be “how to” centric, enabling the member to gather options and seek answers and instruction on how best to use the product of choice. Hands-on experience is a cherished commodity in the community. Conversations are self-policed and best practices can be culled from threaded conversations. That tip or trick posted by one may be the key to unlock productivity enhancements for all members.

**“at a justifiable cost”** speaks to the cost to our members, not only in money, but in time. The efforts required to find answers are minimized by effective web development, search engine functionality, navigational tools, and archiving techniques. The cost of AUGI diminishes greatly when compared to the value the community brings. The cost of supporting this environment and infrastructure will also not place an undue burden on our members.

## AUGI is all about community

So now that we are approaching the 20 year milestone – join with me in wishing all the past, present, and future members a hearty “Happy Birthday.”

Please share your AUGI story via email to [happybirthday@augi.com](mailto:happybirthday@augi.com).



President, Autodesk User Group International (AUGI)

# The CAD Manager



## Network Traffic

All CAD managers oversee a network. I am not talking about the wires that connect server to desktop. I am talking about the network of friends, associates, coworkers, old colleagues, industry connections, and more. I am talking about the people network.

Network traffic is the flow of interactions that happen between you and others as you seek to advance your career, get things done, stay on top of the industry, and provide value to your firm. But in order to have network traffic, you need networks. Let's look at how they are defined, created, and maintained (borrowing some IT terms as we go).

### Local area networks

Your personal local area network consists of close friends and coworkers. It may also include those who are part of your close technical contacts, the ones you rely on to get an answer to a tech-related question. This network is available 24/7 or at least during business hours or extended hours via email and other means. You can get in touch with these people in a fairly short period of time. You can depend on these folks to help you out. They will pause their life to assist you when you need their help.

### Wide area networks

This is just about everybody else. People you have met, vendors, clients, friends of friends, people you have working relationships with outside of your firm, and more. These are the people you could contact, but it may take a while for them to reply. These are the people who may help you out, but you would not ask them for too much until you had a better relationship and moved them into the local network.

### Network architecture

There are several reasons that you will need your network. The need defines the structure, form, and purpose. A January 2007 article in *Harvard Business Review*

defined these forms as Operational, Personal, and Strategic. Most CAD managers have loose networks in place and have a general idea of how to use them.

### Operational networking

The Operational side of things is created at work. It is the web of users, managers, and others who help you get your job done on a daily basis. They are the ones you have gathered so that you can be more efficient in your work. They are mostly oriented toward the current issues and demands that come up. They are defined by the need and structure of the company. Some you can pick and others are foisted upon you. The focus of this group is "how can we get this done, or how can we do it better?" These groups are usually well defined in the firm based on position, authority, task, or assignment.

### Personal networking

The Personal side is created by you. This is your personal group. No one gets in unless you allow them in. Some may overlap from the operational network described above.

This group is created to enhance your personal and professional development. It helps you get things done. It is based on mutual exchange of assistance. You help them, they help you. Its dependability is based on your character. Live up to your word, help others, and they in return will help you. Importance of individual members may ebb and flow, but in a pinch these are the ones you go to first. They have unbiased eyes (hopefully) and can see your blind spots and let you know when you are going in the wrong direction. This group is based on some common interest. They are also connection points to others that are outside your boundaries of interaction. The focus of this group is "how can I get this done, or how can I do it better. I am stuck – help!"

### Strategic networking

This is the area that reaches outside of

your regular circles of work and personal and into the industry in which you work. These contacts are related to big picture issues. The members of this group may not know each other and may never interact. They are selected by you (or they have selected you in their circle) and are needed for long-term planning. They provide the information you need to think about tomorrow.

### Developing networks

Most managers work in the Operational and Personal realms without knowing it. They use these groups to get things done. The good managers work at making the groups more effective. They pay attention to the workings of the firm and know who to go to for what. They avoid the land mines that may catch them if they fail to know who needs to weigh in on an issue. The one group that managers may need to develop is the Strategic group.

Leaders work all three of these areas. They know the value of networking and staying connected.

Quoting from the *Harvard Business Review* article, "What differentiates a leader from a manager, research tells us, is the ability to figure out where to go and to enlist the people and groups necessary to get there. Recruiting stakeholders, lining up allies and sympathizers, diagnosing the political landscape, and brokering conversations among unconnected parties are all part of a leader's job."

Start small and work your way up.

### Making a list... (checking it twice)

Make a list (if needed) of the people you are connected to and where they fit in these groups. See where your gaps are and then move to fill them. You may see that you are overlooked in the Personal area and not connected enough in the Operational. Operational connections tend to be tough when the people who can make

things happen are not ones that we naturally gravitate toward. Even the ones that you do not get along with need to be connected. Avoiding them may cause a failure in your progress on an initiative.

The list is just the start. Making the list does not mean that you have an active and vibrant set of networks.

## Start slowly

Networks are not created overnight. Relationships are the glue that makes all of this stick. Don't just collect names and think that you have networks. That is like running wires and never plugging them in. You have to start making connections and work to sustain them by making consistent contact. I am not saying that you take them out to lunch once a week. I am saying that you stay connected via email, phone messages, short notes, hallway conversations, AUGI user group meetings, and chats at tech conferences or whatever. Just keep them connected.

## Keep it going

Most networks are based on some common interest. The farther you get from your home base, the slimmer the commonality. It is easy to keep the personal network going because you share many common traits and interests. It could be a Friday burger lunch or a movie that you have seen or a tech question that is puz-

zling you both. Relationships develop and are sustained very naturally.

Operational connections have fewer things in common beyond task or assignment. It is a working relationship that draws you together. A shared struggle and success furthers the relationship. Showing interest in areas that are not directly affecting you will help cement a relationship. Ask about initiatives that others are doing that may not include you. Discuss overall firm concerns and objectives.

Strategic alliances are created on purpose. You reach out to make connection with someone you do not know. This takes time and effort. I know, because this is an area that I have to work at. If I am not making contact, then the relationship will fade. How do you connect with someone who does not even know your name? Get an introduction, if possible. One of your other networks may know this person. LinkedIn and Facebook are making this happen on the Internet, but you need to make it happen in real life.

If there is absolutely no connection at all, then just step out there and offer them a hand. You may get rejected or ignored, but keep trying. I recall the first time I tried to connect with an industry leader by suggesting we exchange a few emails on a subject. His response was, "You want to become pen pals?" That was tough to hear. I am sure that he did not

mean it to be negative or a slight, and I am sure that he does not recall saying it, but it did have a negative impact on me. I left that short interaction thinking that I was stupid for thinking that I could connect up with a person who was so well connected. I kept trying to connect, slowly, and as it worked out, we are now connected on a fairly regular basis and he reaches out to me for help as often as I reach out to him. We have a mutually respectful strategic connection that developed over a long period of time.

## Be well connected

In the end, you will have a well-connected group of people who you can help and who can help you. It is very important to your career to make this happen. Start today.



*Mark W. Kiker is president of the AUGI Board of Directors. He is a National CAD Standards Project Team Member and team member of the National BIM Standard. Mark is general editor of BLAUGI and also publishes [caddmanager.com](http://caddmanager.com), the CADD Manager's journal, as well as the [caddmanager.com](http://caddmanager.com) blog. He is a returning faculty member at Autodesk University. He is currently chief information officer for HMC Architects in Ontario, California.*

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# New Features Pack a Punch

AutoCAD® Architecture 2010 is out and packed with new great features that effectively enhance the use of the software and significantly improve workflow. Themes presented in this release are:

1. Improve workflow through a consistent UI including the ribbon.
2. Drive faster and more successful adoption of AutoCAD Architecture by enhancing basic capabilities that are most commonly touched by new and existing users.
3. Promote continuity across releases to boost existing customer satisfaction.

Every new release of AutoCAD Architecture gets more amazing—and 2010 is no exception. The ribbon is back and better than ever! We will spend some time discussing the Application Menu, Ribbon, and Quick Access Toolbar presented in this new release, as well as several other great enhancements. Ready, set, let's go!

## Application menu / ribbon

The ribbon is located on the top of the

application window and it replaces the menus, design bar, and toolbars (see Figure 1). Extensive user research was conducted and it was shown that this more unified format enables users to find the tools they need quickly, thereby helping to increase productivity.

If you are not a fan of having the ribbon across the top, you can change it to vertical orientation by simply undocking it from the horizontal position. You can do this by right-clicking on the ribbon and selecting undock. It is important to find the orientation that works best for you.

The ribbon organizes tools into a collection of several tabs. Each of these tabs represents workflows such as creation, annotation, and collaboration. Each tab contains a series of at least three panels. A panel is a group of tools that are used to accomplish part of the workflow. The ribbon is organized around the way you work and enables you to quickly find the appropriate tools to accomplish your tasks

without feverishly searching all over the user interface.

Autodesk has ensured that all products that implement the ribbon have a common look and feel. With this in mind, a set of companywide guidelines was developed for the supporting icons. These simple yet appealing tools have a distinctive style that speaks directly to the specific tool or task they represent. The final result is a visual language that is unique to Autodesk alone.

In addition to the ribbon, you can click on the Application Menu (red "A") on the top left to reveal a series of basic commands (see Figure 2). These commands are located together for convenience as they are frequently used.

Some commands you will notice are open, save, create and print. As you select these commands, many will bring up more options related to that command. This is indicated by the arrow next to each one. A search bar is also featured, allowing you to search for commands quickly and eas-

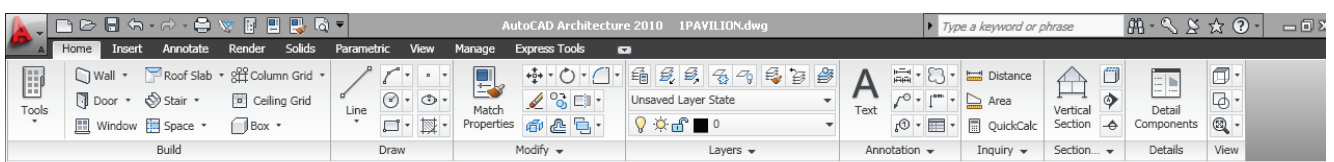


Figure 1: Ribbon and Quick Access Toolbar



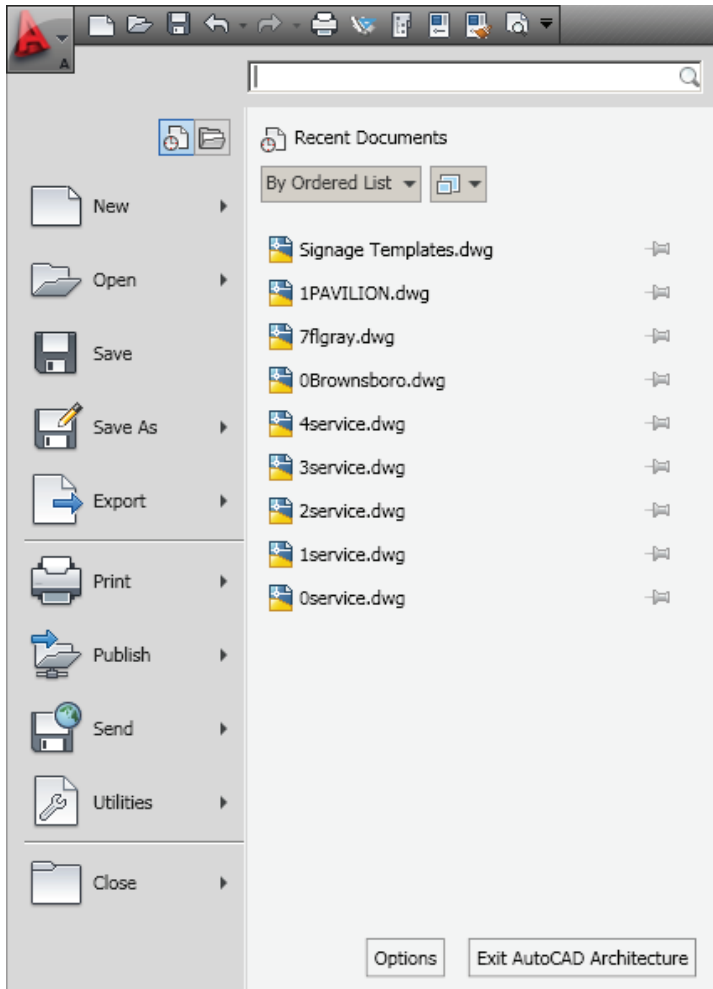


Figure 2: Application Menu

ily. Each search reveals related menu commands, command prompt text strings, and basic tooltips. The Application Menu also tracks recent and open documents.

It is important to note the push pin symbols that you will see both in the Application Menu and on the Ribbon. Application Menu push pins keep a file in the list of recently opened items. On the ribbon, push pins are used to keep a ribbon panel expanded. If there is a ribbon panel that you frequently use, it is a good idea to use to push pin to keep it open.

Above the ribbon is the Quick Access Toolbar. This is a great place for your most used commands. The Project Navigator and Project Browser palettes are included by default, allowing for easy access to projects and easy management of project drawings.

If you would like to add or remove commands, click the down arrow at the end of the toolbar and select Customize Quick Access Toolbar. If a command you wish to add is not listed, select More Commands and select the command from there. You can also copy commands from the ribbon.

## Space separator/polyline tools

AutoCAD Architecture 2010 has a new Space Separator tool that allows you to automatically divide spaces that are not bound by walls with plain AutoCAD line work. This could be done manually before; however, the AecSpaceSeparator command makes this task much easier.

This tool can also be accessed through the Design Tool Palette on the Spaces tab (see Figure 3). You can drag and drop into your drawing from the Design Tool Palette and immediately begin using this tool. The Space Separator tool allows you to assign a Layer Key to the separator line work. Space Separator creates a polyline, allowing you to tag information to this area using Property Set Definitions.

The Draw Order for Spaces is now automatically set to Back. You are no longer required to do this manually. This helps to ensure that space plans will always show the underlying walls and line work whenever they update. This feature is especially helpful when you are in a Display Configuration that contains a solid hatch. If

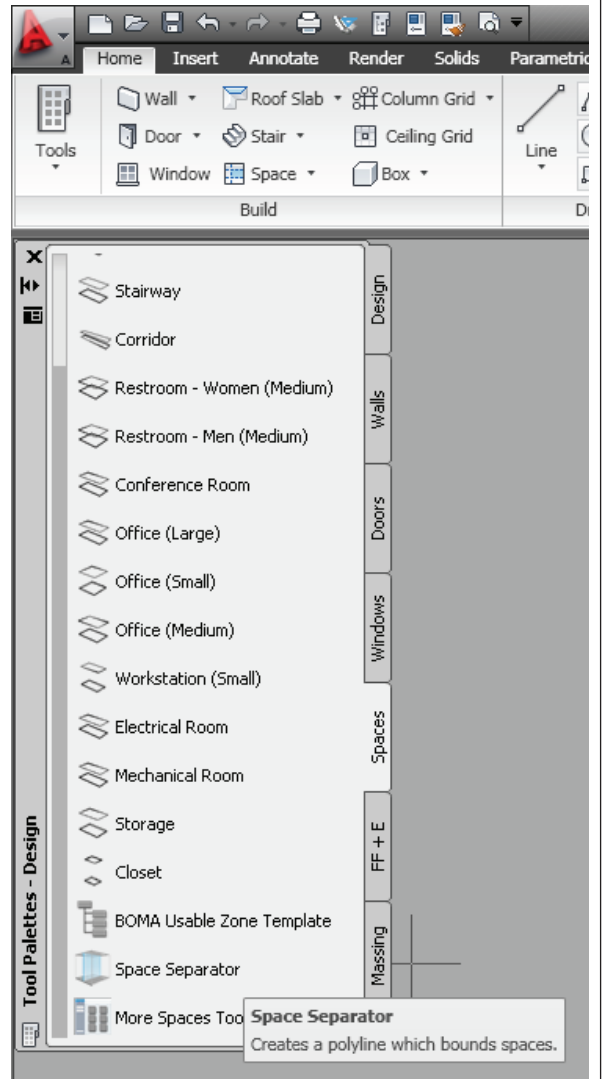


Figure 3: Space Separator Tool

you need to select an associative Space or other line work with boundaries, it is difficult with the graphics being Sent To Back, so remember that you can cycle through objects that overlap by pressing Shift and Spacebar. Otherwise, you may experience a few moments of frustration!

## Dimension enhancements

Autodesk has added a new arrow-shaped, flip text position grip for AEC Dimensions, allowing you to have additional control over text placement. This is an ideal tool for situations when vertical dimensions are rotated greater than 90 degrees, including AEC dimension support for angular walls. There is one grip per AEC Dimension object and it affects all chains and all dimensions.

This tool can be accessed by right-clicking on the dimension and selecting Flip Arrow (see Figure 4). This will flip the dimension to the other side, allowing for better placement and more control over dimension placement.

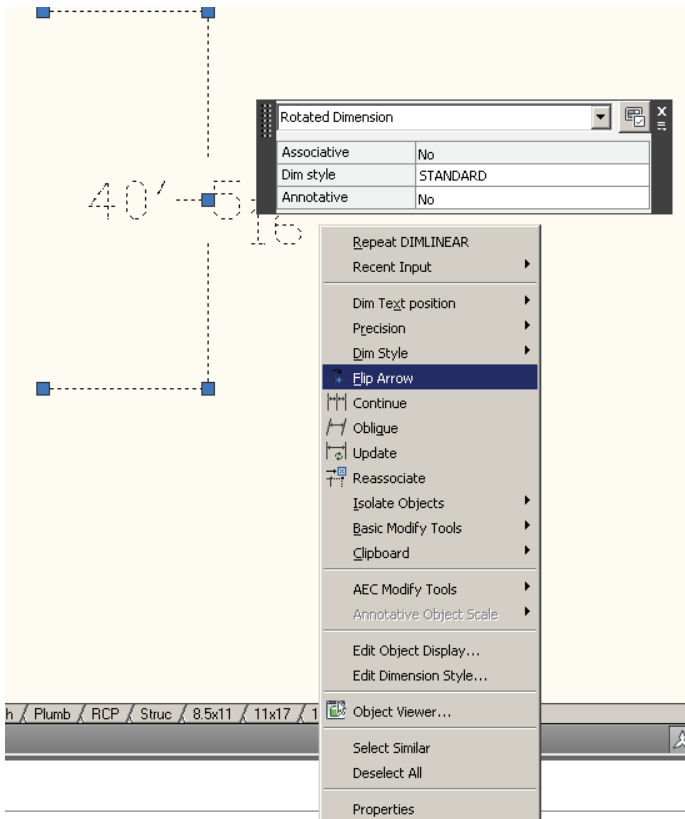


Figure 4: Flip Text tool

## Wall Endcap tools /cleanup enhancements

Wall Endcap editing has been greatly improved. AutoCAD Architecture 2010 has expanded how individual wall components can be edited. Common AutoCAD Architecture 2010 commands such as Trim and Extend have been joined by Fillet and Chamfer, thereby providing even more control in designing walls according to how they will actually be constructed in the field. You can edit wall components by using the buttons on the Profile panel that displays on the ribbon. You can also use the grips that display in the drawing area. Use the Edge grips to offset an edge, add a vertex, or convert it to an arc. Use the Vertex grips to move or remove a vertex.

Autodesk has built on the substantial enhancements to wall cleanups in the previous release. AutoCAD Architecture 2010 software now helps improve wall drafting productivity by using intuitive tools that allow you to draw wall layouts that better reflect actual construction.

Most of the enhancements to walls involve the ability to modify wall cleanups at a component level. Therefore, AutoCAD Architecture 2010 has improved handling of common wall conditions such as:

- Cornered Walls
- Angled Walls
- Intersecting Fire-Rated Walls

## Stair/ramp tools

The Stair tool has been improved in AutoCAD Architecture 2010 through the inclusion of a distinct “ramp” type. This ramp type comes complete with its own display and annotation tags (Percentage Tag, Degree Tag, and Numeric Tag), which gives users the ability to more accurately design and annotate their drawings. This feature was enhanced primarily for the German market, including tags that support the German standard and giving a distinction between ramps and stairs. This is a great enhancement and I look forward to more like this in the future.

## PDF output/underlays

PDF support has been significantly enhanced. PDF publishing now provides better visual quality while utilizing smaller file sizes. PDF output provides more flexibility and higher quality output than was previously available. TrueType fonts are now exported as text rather than as graphics. This enhances the visual quality of text and enables highlighting, searching and copying text within the PDF viewer. Additional improvements enable you to specify merge control, automatically preview the plotted PDF, and include layer information.

You can use the Plotter Configuration Editor to view and modify the PDF settings for plotted output. To do this, select

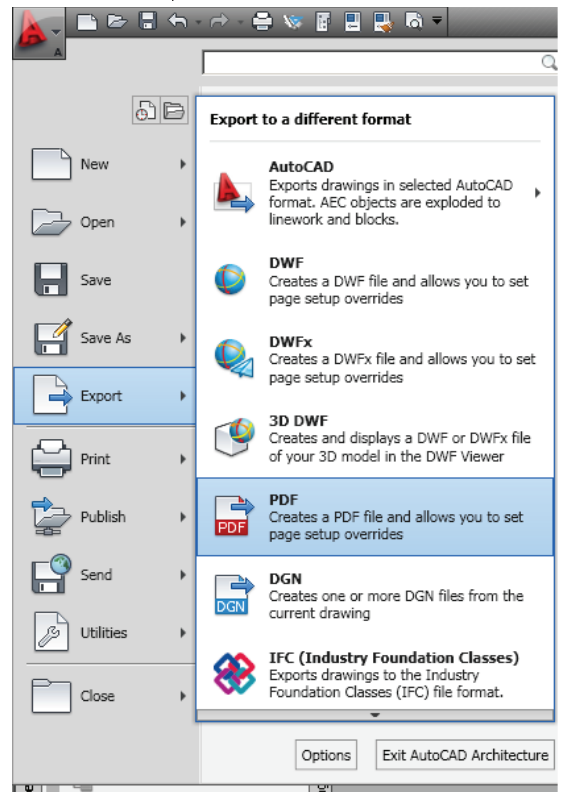


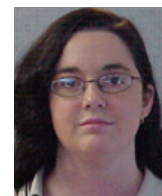
Figure 5: Export to PDF

the DWG to PDF .pc3 plotter in the Plot dialog box and then choose Properties. The new Merge Control option is displayed under the Graphics node. The other options are accessible when you select Custom Properties.

AutoCAD Architecture now enables you to attach a PDF file to a DWG as an underlay. You can work with PDF underlays in the same way that you work with other external references including DWG, DGN, DWF, and image files. You can even snap to key points on PDF geometry using the familiar object snaps.

## Need I say more?

The new features presented in this article are only a few of the many great enhancements in AutoCAD Architecture 2010. I encourage you to get in there, click around and get a good feel for the new changes. I think you will be as happy as I am with AutoCAD Architecture 2010! So...ready, set, go!



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## A Q&A with Lynn Allen

*Few people are as instantly recognizable to AUGI members as Autodesk's Lynn Allen. Long ago dubbed the AUGI Sweetheart, Lynn has been AUGI's champion and cheerleader for years, not only working tirelessly to educate users about Autodesk products, but also doing her enthusiastic part to promote the AUGI organization. Here, she shares some memories*

**AUGIWorld:** Do you remember your first involvement with AUGI (or formerly, the North American AutoCAD User Group - NAAUG)? Was it a meeting? An event? Coffee and donuts?

**Allen:** My first involvement with NAAUG was attending an event at CAD Camp in San Rafael, California. I didn't work for Autodesk at the time; I worked for an Autodesk Training Center. The room was packed! This must have been about 18 years ago. I didn't know anything

about NAAUG at the time, but I was intrigued by the enthusiasm of the people in that room – I do remember that!

**AUGIWorld:** Please share a couple of funny stories about the early days of AUGI... and feel free to name names!

**Allen:** There were lots of good times back in the early days—such enthusiasm, such comradeship. We all really felt like we were making a difference. And, let's face it, when you have an AUGI President like

Donnia Tabor-Hanson there are definitely going to be funny stories to tell! She was a hard-working president, but also hysterical to work with. Those were definitely good times. And John Moran was a walking comedy show—we loved having him on the Board.

As far as funny stories... well, I remember going out to dinner with the AUGI Board when David Harrington was president. He ordered ice cream and they brought him the "display" ice cream by accident, which was really Crisco. He



Photo by Shaan Hurley

took his first bite and flipped out... we all laughed until we were crying!

Then when Yoshi Honda made it on the AUGI Board we used to tease him and tell him that he didn't really make it. We told him we had to fudge the voting process to get him on the Board, which of course was not true at all. For a while there he was really worried! For some sadistic reason, we thought that was just hilarious. For those of you who don't know Yoshi, he ended up being one of the best AUGI Presidents we ever had.

Just a few years ago, while attending an AUGI meeting, I took a big swig of coffee from my travel mug and got coffee on my nose. I proceeded to talk to the board (with coffee still on my nose) until Robert Bell finally wrote me a note. I was so embarrassed! We all laughed, but I'll always remember that as being the first time I met Robert Bell (who I adore to this day).

**AUGIWorld:** What impact do you think AUGI has had in your career? The industry? The users of the software?

**Allen:** My experience as Autodesk Worldwide User Group Manager was the best time of my career life. We worked with such amazing people and we thought we were really making a difference. To this day I consider myself fortunate to work with AUGI whenever possible (and I always look forward to having the AUGI Board over for dinner!).

The AUGI Regional User Group Meetings also helped to leap start my speaking career. My next job was Autodesk Technical Evangelist and I learned much from the many presentations I did for user groups.

Internally at Autodesk, we still look to AUGI to provide those extremely valuable Wish Lists for our products. We are 100 percent in support of any organization, like AUGI, that brings product users together and helps them be more productive.

Users helping Users...that's what it is all about!

**AUGIWorld:** Do you think AUGI has changed over the years? If so how?

**Allen:** Remember that in the early days of NAAUG, there was no Internet so definitely things have changed! But just like then, AUGI is still made up of passionate users that want to learn more about the Autodesk products they use, and are willing to share information.

We used to charge for being a member of AUGI, which helped fund the organization. Even though the membership fee was low (\$35), it still kept some users from being able to participate. I was delighted when we were able to go to a free organization so there would be no monetary obstacles from joining.

**AUGIWorld:** You are known as AUGI's Sweetheart. Do you remember where the term "AUGI's Sweetheart" came from and who first used it?

**Allen:** Oh my, I really should remember when I was dubbed AUGI's Sweetheart, but unfortunately I don't! I'm sure that someone out there remembers. I believe it started after I was no longer "officially" working with AUGI (it was no longer part of my job), but I still kept attending the meetings and helping out anyway. It was a labor of love for me, and I was so appreciative that I was still invited to attend the meetings. Somehow, they decided that made me a Sweetheart. I remember being announced as AUGI's Sweetheart at AU and I was very touched. They even gave me business cards with that title!

**AUGIWorld:** It sounds like AUGI holds a special place in your heart. Can you share some of those feelings?

**Allen:** AUGI definitely holds a special place in my heart. I want AUGI to thrive for many, many years to come and for there always to be a place for users to join together with other users from all around the world.

**AUGIWorld:** What do you like most about AUGI?

**Allen:** Users helping out other users.

**AUGIWorld:** Any other comments about AUGI turning 20? Memories? Horror stories?

**Allen:** You've come a long way, AUGI! I can't help but smile when I think of all the good times. We've definitely had some bumps and drama along the way, but we somehow always emerged stronger. I hope AUGI has another fantastic 20 years (and then some!).

# Enhancing Performance in Revit MEP

With all the benefits of BIM technology too often we forget to mention one of the biggest drawbacks of its use—the hardware and computing power it takes to process that much data. For Autodesk® Revit® MEP users, this issue could be one of the make-or-break decisions in whether or not they adopt the software. No matter how large and slow the architectural model may get, the MEP designers always have it worse because they need to work and place their own information inside the architectural model environment. This article covers many of the tricks Autodesk recommends when modeling in a Revit MEP environment; it also applies to a Revit environment in general.

## View settings

To achieve the best performance, we should start by looking at the settings that make up your views. The largest impact to the performance of the model is the Model Graphics Style, which is used in the manipulation of your views. Examples of manipulation include scroll, pan, and zoom.

Due to the processing time it takes to determine where gaps and hidden lines should appear or be taken out, Hidden Line style is one of the most detrimental settings in terms of performance. Of

course, this is also the traditional view by which we do our construction documentation! In order to handle this situation, it is recommended that we set up the model with two different view types: a Model view and a Sheet view.

**Model views:** As the name suggests, these are the views where the majority of modeling will take place. In your Model views, it is recommended that you use the wireframe graphics style to achieve the best performance. Wireframe can get confusing at times due to all the lines on the screen, but in terms of tasks that require regeneration of the model this is the easiest environment for Revit to process its graphic information. So you finally have a use for Wireframe beyond seeing relationships of

objects and to ease the selection of entities!

**Sheet Views:** These views can be created in two different ways. The first way is to do all your manipulations in a Model view and then to Duplicate the model view to become a Sheet view. Then you can simply change the Model Graphics style to Hidden Line in order to generate your CDs.

The next way to generate these views would be to use Dependent views of your Model views. The majority of changes and notation could be completed in the Model view while the Sheet view (Dependent view) is turned on with the Hidden Line graphics style. As long as that view isn't activated, you will not notice a drop in performance.

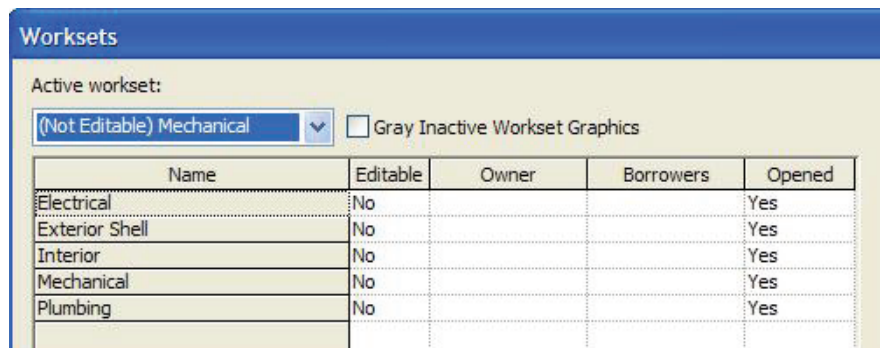


Figure 1: Worksets have their advantages, even if only one person is working on a project.

One more tip: While working in Wireframe mode you can use duct and pipe color fills to better see these entities while you are modeling.

## Multiple files

While it is tempting to do all your MEP modeling in one file (after all, the architects typically do this, right?) there are times where this will not be the best way to handle things.

The larger a system becomes the more data that needs to be tracked within a project. Thus, information such as the direction of flow for dampers and valves can cause your model to take a performance hit. To resolve this, many firms will break up the model into separate files based on their location in the building (example: different building wings) or based on discipline (example: Electrical, Mechanical, Plumbing, Fire Protection).

What this means is that you are best served to do some pre-planning before starting your projects. Will you be better off breaking disciplines up into multiple files or perhaps into multiple Worksets? And speaking of worksets....

## Worksets

Worksets are enabled when Worksharing is first initialized. While in theory Worksharing is used to allow multiple people to work on a project simultaneously, it can also be used to improve the performance of your model as well.

This performance improvement occurs because Revit is not required to load the entities on that workset into RAM in order to process them.

It should be noted that Worksets will not be the ultimate way to aid your model performance—anything that interacts with items in other worksets will force those items to be adjusted due to Revit's method of keeping documentation and information coordinated. As a result, instead of speeding you up, the use of Worksets may instead just enhance your ability to not slow down.

## Back to the basics

There are many settings that affect all versions of Revit. Some of these items are well known; others, not so much. Let's review some of the basics.

**Groups:** Great for object control, but too many of these items will begin to create performance issues in your model.

**Arrays:** While they provide control over groups of entities in a project, the Group and Associate function in the Array command can also cause performance issues as mentioned above in Groups.

Remember, Arrays by default can create multiple Groups.

**Warnings:** Revit monitors the warnings in your projects. Because of this, Revit will constantly watch to see if each of these warnings have been addressed. A handful of warnings is not a problem, but it isn't uncommon for a mismanaged project to have a hundred or even several hundred warning messages that must be addressed. The more warning messages, the longer it will take Revit to process your model.

**Constraints:** Constraints are the double-edged sword of the Revit environment. Having constraints can reduce error messages when moving objects and they can also reduce worksharing issues by not allowing a user to accidentally take control of an object.

Of course, Constraints are another item that require Revit to monitor physical relationships. If a wall moves in one view, then any objects, doors, windows, and anything constrained to it in that view and any other open views will also need to move and regenerate. So constraints will reduce errors but will increase the amount of time it takes Revit to keep the model coordinated.

**Design options:** Each design option will increase the model size and also force Revit to keep more items coordinated. So reducing the number of design options will make the "model load" easier for Revit to handle.

ger you use the program I believe you'll realize that DWG files make you feel good and the same time strike great concern.

Bringing in a DWG file containing a previously finished CAD detail can save great time when a project deadline is looming. CAD drawings are also a great source for incorporating legacy backgrounds, drawings from civil engineers, and "blocks" you find from online/product resources. But experienced Revit users all have stories of the problems DWGs can create. Examples include:

- Extra unwanted linestyles
- AutoCAD® layers brought into Revit
- AutoCAD text styles brought into Revit and not meeting standards
- Dimensions that look like Dimensions but actually are individual lines that do not update
- Hatch patterns that are gone or do not display properly
- Extra unwanted lines
- Slower/larger Revit files (with an emphasis on slower)

When the opportunity exists, do not explode your AutoCAD entities; instead, use them as a reference to trace over. When time allows, redraw your AutoCAD details instead of importing them and cleaning them up. This will keep your Revit files smaller and easier to process. This may seem like more work, but when project

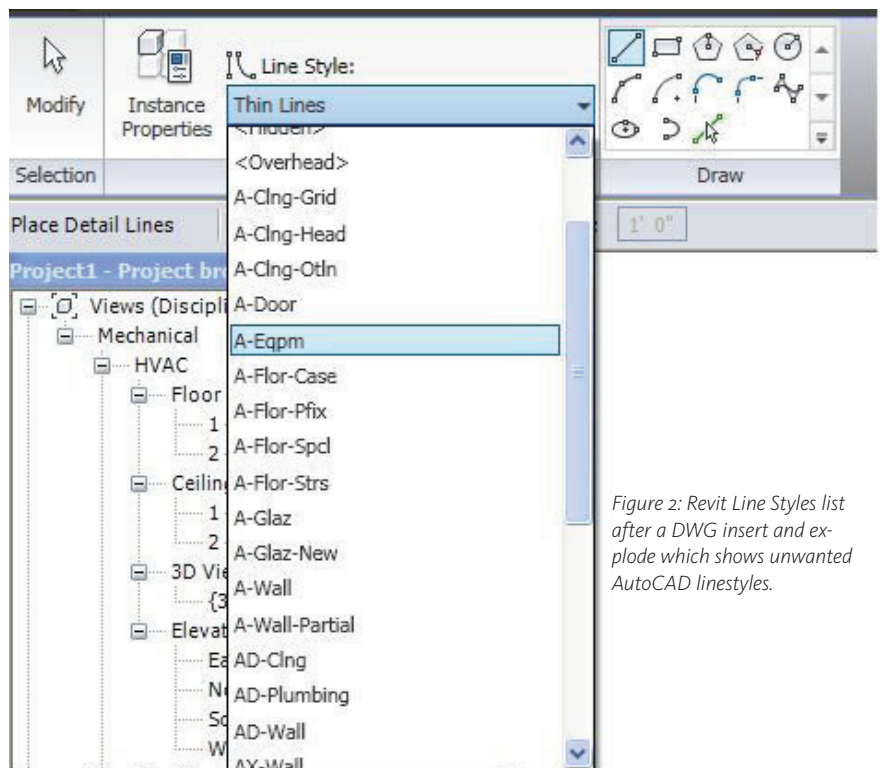


Figure 2: Revit Line Styles list after a DWG insert and explode which shows unwanted AutoCAD linestyles.

**DWG files:** If you are new to using Revit you may not feel this way, but the lon-

g deadlines loom, you will be glad that you did things the right way.

**Family creation:** Use family components instead of in-place families as often as possible. Revit is a database program; the more entities placed in the database, the longer it will take Revit to process the information (and the bigger your Revit file will be). When you place multiple in-place families in your project each time that

slowed down by the data provided by the other trades. Collision detection can still be performed by linking in the appropriate models.

**Raster images:** It will be tempting to do renderings to show off conditions to contractors or clients. This is okay, but avoid hosting them in your project file. Also

**Rooms and spaces:** When linking in a Revit file, an option in the properties of the linked file will be to perform Room Bounding. Make sure this option is turned off unless you need this functionality. Also be sure to resolve any warnings that are generated by linking that model into your project. Remember, warnings slow down your project.

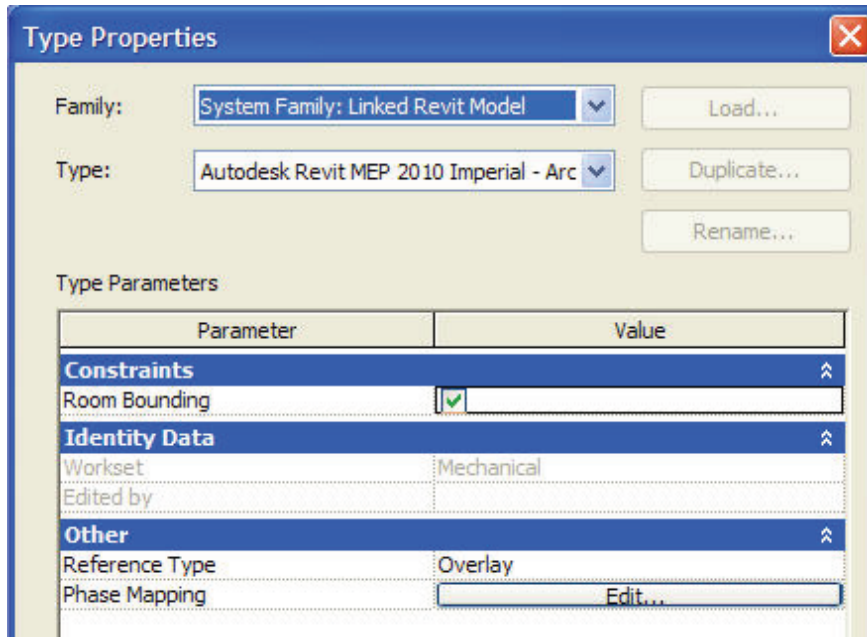


Figure 3: The Room Bounding box in the properties of the linked Revit project.

family is placed, it will create a new Revit in-place family for it. Component families do not do this—they are referenced as one instance in Revit. So Component families create smaller, easier-to-process projects.

Other Family issues to know about:

- Limit widespread use of Voids.
- Avoid Arrays and Formulas in families when not required.
- Limit the amount of embedded detail and modeling in the family. (No, modeling keyholes and nesting families inside each family will not make using Revit “better” and it is not the intended use of the software.)
- 2D Families are smaller and contain as much information in terms of scheduling and quantity take-offs as their 3D counterparts. I suggest using 3D families only when sections, elevations, and details are required if you are working on a large project.

**Importing and linking:** For best performance, remove unused links from your project. Also, on large projects it makes sense to have separate RVT files linked into the project. For instance, plumbing, HVAC, and electrical may each have their own Revit files that can be linked into the main project file. By keeping them separate, your individual trades will not be

avoid large images for company logos, and so on. Raster images can be quite large; I once saw a designer link in a civil topo image and wonder why he couldn’t pan in his project. Please place images responsibly.

**Views:** Here is a list of good tips.

- Create a simple drafting view that you will keep open when you Save and close Revit. This will prevent the entire building from being regenerated when Revit opens. I’ve seen this save several minutes on large projects.
- Keep open only the views that you are currently referencing/need. Each time you make a change, that change also updates in every open view whether you can see the view or not.
- Wireframe and Shading modes are much faster than Hidden Line and Shading with Edges modes.
- Hiding large quantities of items individually will slow the performance of that view.
- Zooming in helps in selecting objects as well as regeneration time.
- The Course level of detail will typically process faster than a Fine level of detail.
- Leave shadows OFF unless you are getting ready to print.

## More to think about

It’s amazing we’ve made it this far without mentioning the most obvious choice for speed—hardware improvements. The number of people who are using single processors and 2GB of RAM and are curious as to why Revit is slow is staggering. Revit, at its heart, is an easy program to use, but the level of information that architects and engineers input into a project is enormous. Always be ready for the worst-case scenario, with Revit you can never have too much RAM or processing power. If you think your computer “might be a bit slow,” then it likely IS a bit slow for running Revit.

On a related note, if you are running 4GB of RAM on a Windows XP machine you should also think about enabling the 3GB switch for Revit, which may keep your system a bit more stable. Type “3gb switch” in Revit Help to get more information.

## ...and finally

You can find many more tips in the following Autodesk technical document:

[http://images.autodesk.com/adsk/files/revit\\_tech\\_note.pdf](http://images.autodesk.com/adsk/files/revit_tech_note.pdf)

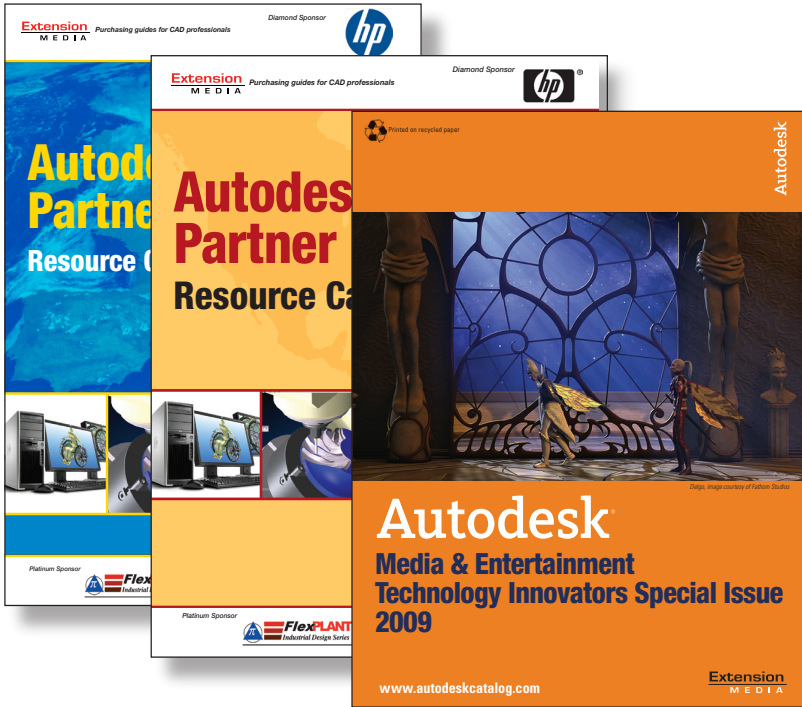
It is important to note that these are just the basics and that every project is a little different! The tips I’ve included in this article are the traditional processes that I teach to novice BIM managers. While these tips are valuable to all Revit disciplines, they are VITAL for the MEP crowd that typically have more data, larger models, and more processing issues than any of the other trades. Proper planning and following “the rules” is one of the most vital parts of your success in Revit (as existing Revit MEP users already know!)



*Brian Myers is an applications engineer for Seiler Instrument in St Louis, Missouri. He’s been using Autodesk products for 20 years in a variety of industries including residential and commercial design. Brian can be contacted at [bmyers@seilerinst.com](mailto:bmyers@seilerinst.com) and has a Twitter account at <https://twitter.com/BIMfacts>*



# Three Essential Resources for Design Professionals Using Autodesk Applications



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# Achieving the “Wow” Factor in Revit Structure Models

These days our designs get more complex and hard to convey in simple terms to the clients. Autodesk® Revit® does a great job designing, documenting, and assisting in the engineering of a building, but you might want to try using Autodesk® 3ds Max® Design to assist you along the way.

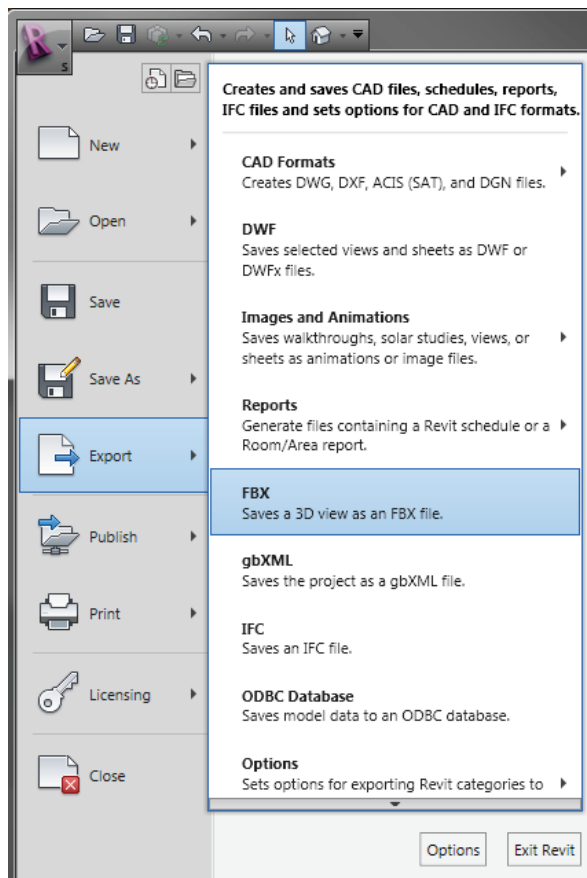
What will 3ds Max Design do for you and why use it? It will allow you to provide animations of your building. For example, you can animate a construction sequence to help the client better visualize not only how the building will look upon completion, but also how it will look during construction. This is especially helpful if you have a complex structural element that is not coming across clearly on paper, especially during conceptual or schematic design stages.

The process is fairly simple and you don't need a degree in 3ds Max Design to achieve a good animation or presentation render.

## The prep work

The first course of action will be to ensure that you are in 3D view in Revit. This will not work from any 2D view.

Now go to the application button. Choose Export, then select FBX. Save the file.



That's all there is to it on the Revit side. Now it's time to open Autodesk 3ds Max Design.

Once the application opens, select the application button and choose Import

and then click on Import again. Navigate to where you saved the FBX file from Revit and choose that file in the dialog box that appears.

It will ask you to confirm the presets for the file selected. Verify that it defaults to Autodesk Architectural (Revit)—this is the setting you want even though you exported from Revit Structure or Revit MEP.

I would suggest that you update your FBX plug-in to the latest (2010.2 is the current version at the time of this writing).

Not sure what version you have? On the FBX import Dialog window, you should see the version number in the title bar of the window. Located in the same window is a button called “Web updates.” Click that, and it will compare your version to the current version and tell you if yours is up to date. If not, it will provide a link to obtain the newer version.

Once you click OK after picking your FBX file to import you might be greeted with a “Warnings and Errors” dialog box. This usually warns you that “Watts will be converted to Lumens” and sometimes warns about camera angle; in most cases both can be ignored, so just click OK on the window.

## The creation process

The file should show you the model in your scene. First select an object from the scene that you wish to animate. I'll choose a roof from my sample project. You will notice that all the objects from the Revit model appear similar to the way they looked in Revit. Click "Set Key" in the "Time and Animation Controls" located at the bottom of the screen (see Figure 2). This enables you to set Keys (start and stop points) along the timeline of your animation. The program will automatically blend the animation between two keys set for the object in motion.

Drag the timeline key indicator to the end of the timeline (see Figure 3). Then click the large button that looks like



a key. This sets a key at the end of the timeline. Now slide the timeline indicator back to the beginning and click the same key button as you did at the end of the timeline.

You are now ready to click the move command and move the roof up and out of the scene.

Repeat the process for all the items you want to move. You can select multiple ob-

jects and have them move all at once or one at a time.

If you have a lot of objects you want to animate I recommend using "Animation Layers" to help sort and control your animation.

Use Batch Render to export your animation. Render time will depend on your computer specifications and quality of your render.

They are many other things you can do to the model. For example, you can adjust or replace the materials that were carried over from Revit 2010 if your intent is to create a more realistic render than what the materials from Revit will produce. You can also "dumb down" the rendering so that it resembles a freehand sketch or a

blueprint. This is all done through the materials and filters in 3ds Max Design.

You can merge other disciplines' models if you want. If you're an Autodesk Subscription member, you can download a new extensions manager that will allow you to import native sketch-up models as well.

This is great if you want to show the assembly of your structure, then show how it looks with the architects model over it, for

example. You can even set a transparency for the architectural element (through the materials).

*You'll be surprised what you can get out of a model that you created in Revit Structure 2010*

The program has some lighting analysis tools if you have MEP in your office; otherwise, that component is not really useful for structural engineers.

It should be pointed out that this process is one-way, so what you do in 3ds Max Design will not affect the original Revit file, and vice versa.

I suggest that you start simple. The program is not that hard to learn, but its interface is quite different from AutoCAD and Revit. Also, render at a lower quality until you are happy with the final version.

One good tip is to employ the "Play" feature; a click on this button allows you to test your animation without rendering so you can see in the current viewport how it will look. You can also move it frame by frame if you like. Just make sure that you take note of what frame you are in along the timeline before you change or move objects.

## Conclusion

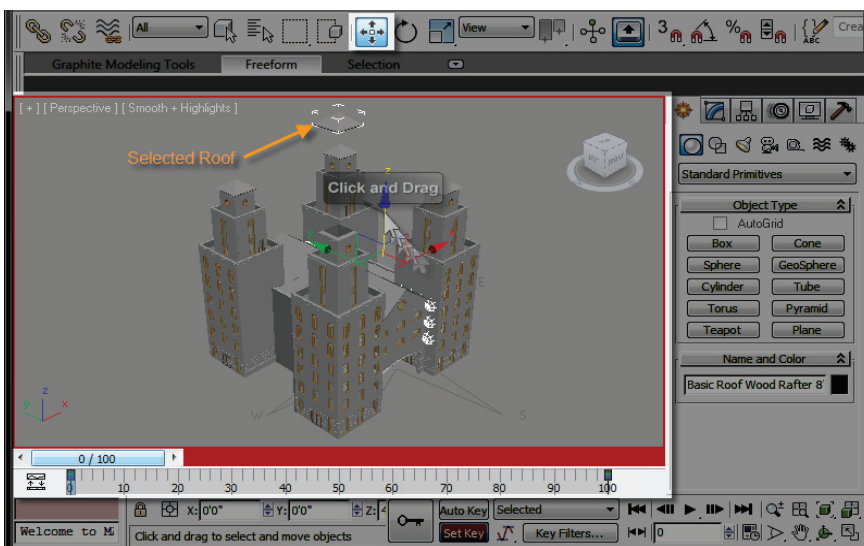
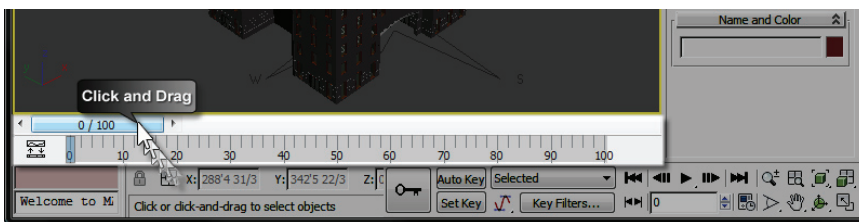
Autodesk 3ds Max Design is a great application to assist you from the conceptual right through to the construction document stage, giving you great presentation material for very little effort.

Once you start using the program let your imagination take over and you'll be surprised what you can get out of a model that you created in Revit Structure 2010.

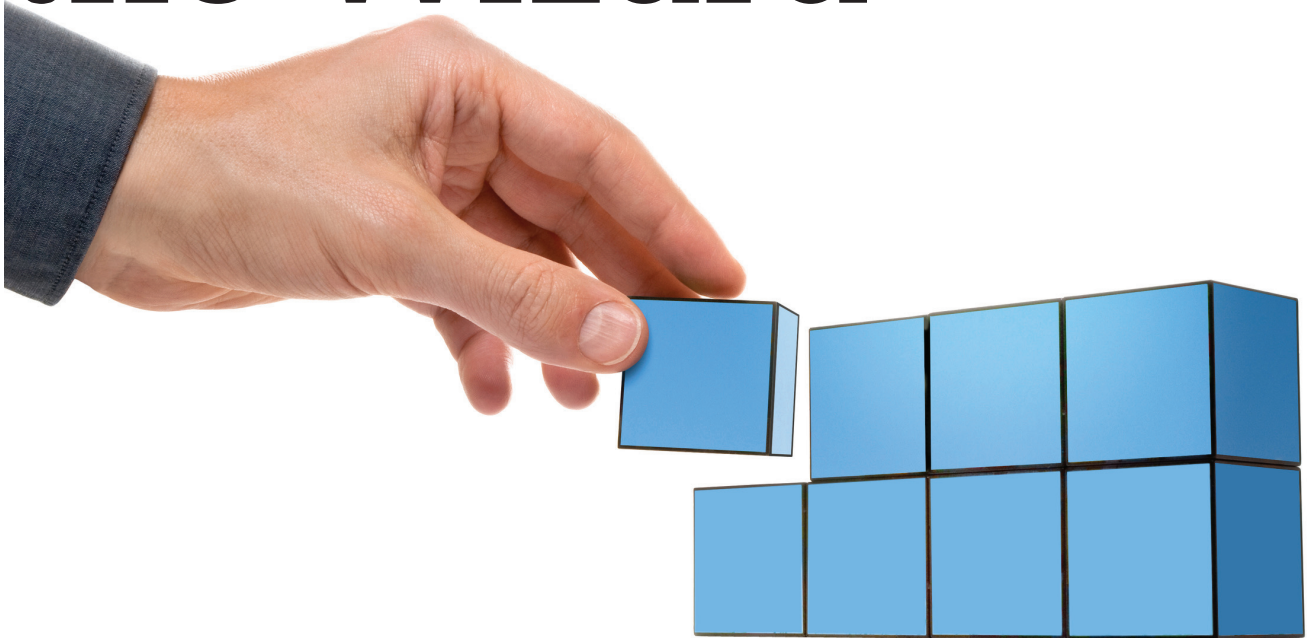
Many engineers never realize the potential a 3D model holds for them until they start making and using one. Using an application such as 3ds Max Design will help you leverage the possibilities of that BIM model. And you'll receive additional benefits from being able to communicate—clearly and visually—with clients, even in the beginning of the design stage.



*Robert Coutu is a Application Specialist who has worked with Autodesk Revit since 1999. In addition, he has worked with AutoCAD, Autodesk 3ds Max, and a wide assortment of other CAD applications for more than 18 years. He can be reached at [racoutu@comcast.net](mailto:racoutu@comcast.net)*



# Streamline Style Creation with the Wizard



Autodesk has pushed hard to get its product line streamlined and to give many of its products a similar look and feel. The Ribbon interface is a recent example of the latter. Now, cross-platform users can easily move from one application to another. This also flattens the learning curve, since the interface and methodology is similar from one application to another. Another good example of this is styles.

We all know that styles make the world go round. Styles have become so pronounced in our daily work that we tend to forget the “wow” aspect that was present at the beginning of this journey. I remember recreating and formatting Profile texts for every submittal using Land Desktop, only to have to reformat it all after changes resulting from municipality comments.

AutoCAD® Civil 3D® broke the vicious cycle by creating a platform of styles upon which everything rode. The vertical profile was one of many things that could be

tuned to exact output formatting, resulting in submittal-ready texts, colors, and layers at the instant the profile view was created. I remember importing a Pipe Network into a profile view, and thinking there is no way it will be this easy. A few finished grade changes later and the profile view updated; I was hooked. It wasn't that the view updated everything in it, but rather that the result, no matter what I did, was submittal ready.

Another nice aspect of styles was that multiple variations could be cataloged, allowing the user to change the appearance of the plan quickly by swapping out the styles referenced instead of reformatting associated texts and colors. This allowed different companies or departments to use the same entities in a design without changing the entity itself; just the appearance style.

As drawings come in that contain existing storm structures and centerline alignments, for example, we simply apply dif-

ferent styles to shift the focus over to the new proposed features without having to touch the existing entities at all. All the appearances change consistently!

While the styles are a welcomed enhancement by some, many new users and even some experienced ones still have a hard time with the overwhelming array of styles in Civil 3D. Most new users hopefully get the benefit of someone else's trials by inheriting the company styles template that has already been formatted through years of struggle.

However, there are many cases where a new company needs to get the show on the road. New users often suffer through the trial and error headache as they attempt to determine what this or that setting does. When I started, there was almost nothing useful online. I recall reading an article that stated that a CAD manager could expect to spend two weeks solid formatting all the company items into useful styles.

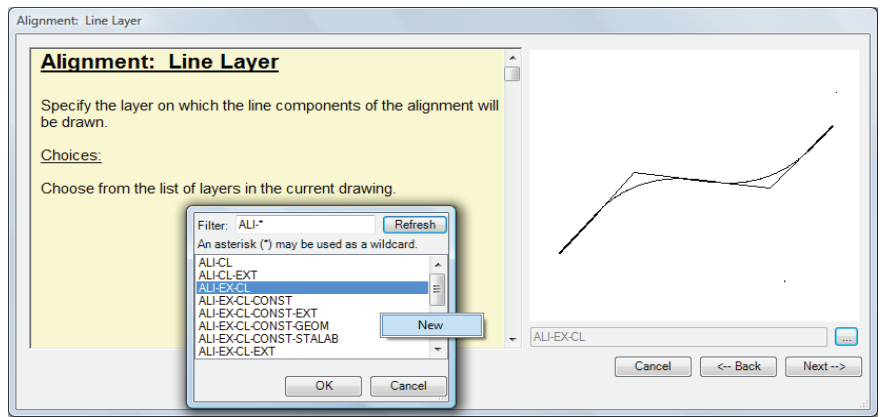
While Autodesk furnishes some basic styles preset, the chances are slim that these will fit the image and style that any particular company has developed over the years. Similarly, the prospect of adopting the provided styles in order to “get back to work” is unacceptable. In many cases, companies making the jump to Civil 3D are often introduced to the aspect of having to pay a consultant to come in and get the styles formatted as they might need, allowing them to get back to production and pay their bills.

## The Style Wizard is released

On July 21, 2009, Angel Espinoza posted a link to Autodesk’s release of the Style Wizard for 2010. I had some lingering questions about the wizard, so I contacted Mr. Espinoza. He indicated that as the Technical Specialists traveled and interacted with end users, a common theme was emerging. Small companies with a limited staff experienced a production bottleneck as one or two individuals tried to establish the required company styles. Requests came in for a solution and the wizard was created.

The intent was to provide a simple solution to establish new styles through an easy-to-use interface. Users knew how they wanted surface contours to look, and the wizard provided a very fast avenue to achieve the desired results. Numerous other features were added, and after a great deal of testing and review, the wizard was released. It was not intended as a Civil 3D component and is specifically created to aid those small companies and new users that are struggling.

Creating a new style is as simple as selecting the feature style desired and pick-



Feature Style Editor

ing the “Create New” button. The wizard then walks the user through pages that establish each of the core components in the particular style they wish to create.

While the simplicity of the wizard stands out, the fact is that many useful and often necessary components are beyond the control of the user. The reasoning behind this reduced functionality was to limit the decisions users would have to make, thus creating a faster and less confusing environment from which to create and edit styles.

Various components in some styles are often not utilized and they simply slow down most users. Autodesk identified these components and excluded them from the wizard pages. The remaining non-wizard components are created using the values stored in the style defaults. Anything the wizard does not affect will emerge from these default settings.

## The features

The utility installs through windows and is run from the AutoCAD command line

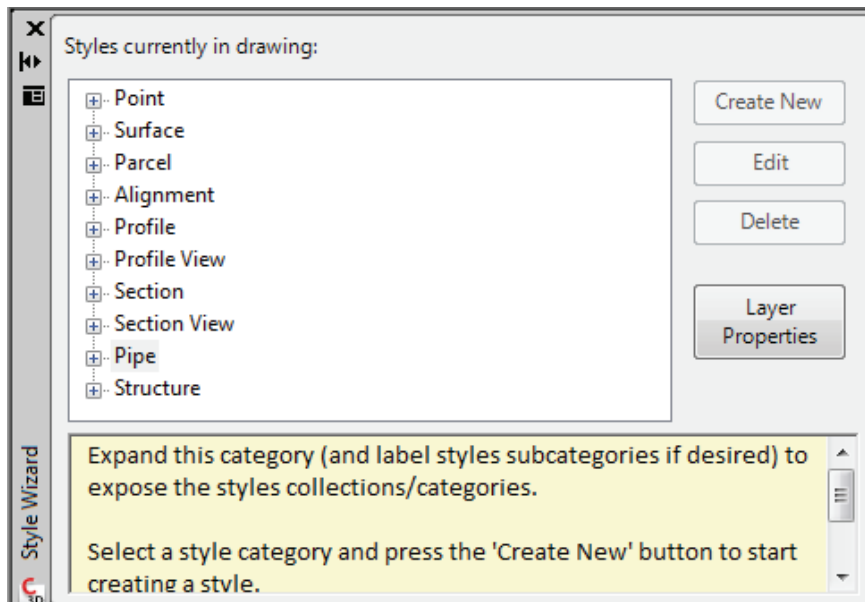
by typing “AeccXStyleWizard.” The wizard will appear in a dockable dialog, containing all the styles present in the current drawing. All the styles are grouped in a tree interface similar to the toolspace settings tab, collected under their respective feature headers. As each feature is expanded, the respective styles that are available in the current drawing are exposed.

Once the user picks the substyle and selects either the Create New or Edit buttons, the wizard takes over. If a new style is indicated, the user is then prompted for the new style name. The first page is then opened. Each page is laid out in a very simplified manner. To the left on each page is an explanation of the style’s component being edited and the options that are available.

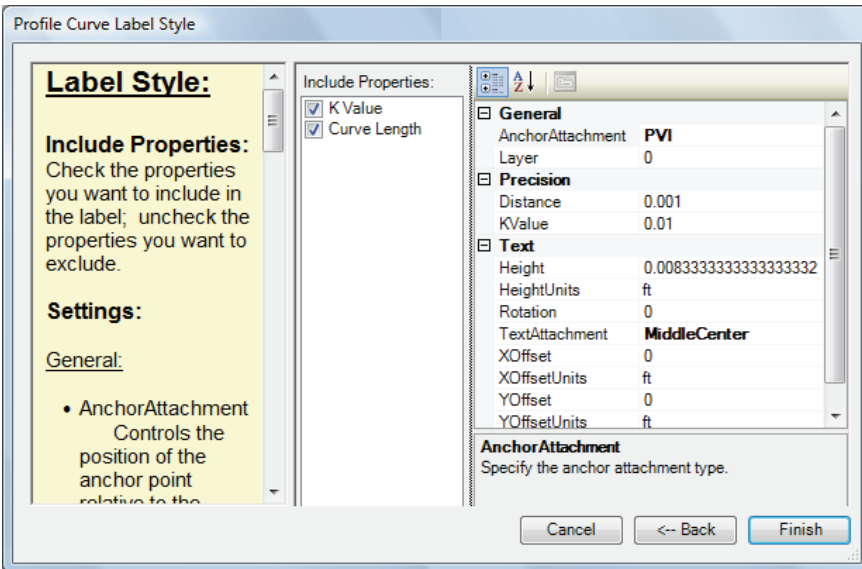
Autodesk realized that it was difficult for many new users to get a feel for each style component controlled and also to understand all the new style terminology. The explanations are fairly simple and plain, but have been placed in a good location to ease new users through the process. This might actually prove to be a reassurance for new users who struggle through the editing process, as it aids the understanding that the changes being introduced will be applied to the component desired.

Beyond the explanations, the dialogs contain key differences depending on the feature being created. Feature styles will have a feature preview on the right-hand side with the editing options directly below the preview. The preview cannot show many items, including text, as I suspect this helps the wizard remain small and trouble free. The intent is to provide some simple but positive feedback that the changes being made are in fact what were envisioned by the user.

Label styles will have no preview. Instead, the middle area contains optional properties to include in the label, and the related label formatting options appear to the right.



Main dialog



Label Style editor

At the bottom of each page are the “Cancel,” “Back,” and “Finish” buttons.

Note: Moving Back currently tends to reset all the components to their default values. I hope that future enhancements may fix this issue. You can use the Cancel button instead and get the same result.

When completed, the wizard will ask you if you want to create another style. If not, you will be returned to the drawing workspace.

## Non-specific features and limitations

Here are a few things that apply to all features in the wizard.

All styles include the display layer settings. These are selected from a list of existing drawing layers and a simple filter is available at the top, making the selection a bit easier to navigate.

While Feature Styles can be created and edited, Label styles are limited to the creation of new styles only. Whether this was an intended limitation or a bug, I cannot say; however, the odds are that it is intentional. There are so many factors in existing label styles that editing existing styles may have been too complex for the wizard.

When a label style is created, the wizard initiates only one new layout tab component. That new component will be named `AeccXTextLabelComponent_AutoGenerated`. In all label styles, the components are chosen individually from a list that is in many cases substantially smaller than what is typically available through conventional style creation methods. While the component options such as name and description are selectable, all selected labels are concatenated into one component. They are center justified and some label headers are applied such as Northing; and Easting; that

are not adjustable. The components settings available include the text display layer, size, justification, anchor, and offsets.

Non-key settings of the layout component, as well as settings contained in the General tab, the Dragged State tab, and Summary tab, will be unavailable and will be derived from the defaults mentioned previously. The result is a fast label style that is easily put into service with the least amount of time.

## Excluded features

While many Civil entity style types are available, such as Point and Alignment, others are excluded:

General, Grading, Sample Line, Mass

hall Line, Mass Haul View, Pipe Network, Corridor, Intersection, Assembly, Sub-assembly, Quantity Takeoff, Survey, View Frame Group, View Frame, Match line, and Building Site are not included.

Similar to the major entity types, there are a few substyle types, such as Surface Slope, that are not included as well.

- Surfaces – Slope and Watershed
- Alignments – Label sets, Profile Geometry Point, Station Equation, Design Speed, Super-elevation Critical Points, Station and Offset, and Tangent Intersection.
- Profiles – Label sets and Horizontal Geometry Points
- Profile Views – Depth, Projection, and Bands
- Sections – Label sets and Segments

- Section views – Sheet Styles, Grade, and Projection label styles
- Pipe and Structure – No Label styles are available

## Final thoughts

I would like to see the wizard expanded to encompass all the Civil entities, or at least the pipe and structure labels. A radio button to turn it from Basic to Advanced might be a nice feature. Seeing it pulled out as an executable, externally capable of adding missing styles to an existing template drawing wouldn't be a crime either. For a pipe dream of overstuffed utilities, I wouldn't complain if they added a way to collect existing styles from one drawing and place them into another.

Some experienced Civil users may not find the wizard very useful because of its simplicity. It lacks many options that veteran users need to employ. This does not mean, however, that it has no place with larger and more experienced departments. With a thorough set of entity style defaults, the wizard can bang out those one-time-need styles very quickly.

The intent of the application was to aid small companies and new users trying to get a basic set of styles in operation. A good jumping off point, if you will. From there, specific and more advanced changes can be made to those styles using the tool-space style editing methods as needed. The wizard should provide a really good tool for those new users to get their Civil designs in motion and to get past the overwhelming appearance of styles.

When new layers are needed, right click the layer list and the 'NEW' option will appear.



Using the wizard's delete button can make short work out of cleaning out a derived style set.

Don't forget to prepare your style defaults: `ToolSpace -> Settings Tab -> Entity -> Style`. Right Click on the specific Style header, and select 'Edit Style Defaults...'



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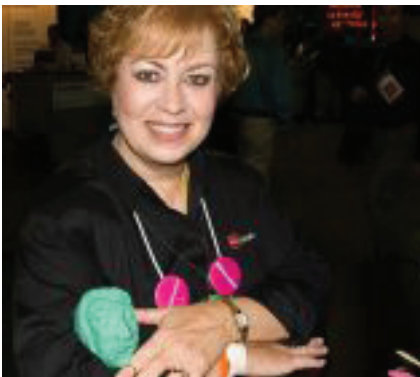
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## An Interview with Donnia Tabor-Hanson



**AUGIWorld:** When did you first become affiliated with AUGI?

**Donnia:** I first learned of NAAUG – North American AutoCAD User Group – through a promotional piece that was included in the box of software. It was very early for NAAUG I know, because my membership number was 1971. I received a t-shirt, newsletters, and a disk with some LISP and docs on it—all for my yearly membership of \$25. It was through this membership that I learned about the first Autodesk University that was held in San Francisco in 1993. I have not missed a single AU since that year—even the year they had four “mini” AUs. I was at each

*AUGI is an organization where Lynn Allen is your Sweetheart and Donnia Tabor-Hanson is your CAD Mama. Just like any good mother, Donnia is nurturing and always eager to help. In short, the perfect role model for all AUGI members. Here, she comments on the organization and offers a handful of AUGI anecdotes*

one of them because I was also teaching that year.

**AUGIWorld:** What made you get involved with the organization in the “early days”?

**Donnia:** One of the things that I got from NAAUG early on was the Local User Group Handbook. This helped me get a local group started in East Tennessee called the Smoky Mountain Autodesk User Group or SMAUG. In conversing with the LUG Manager from the Board of Directors, I got to know more about NAAUG and the other programs. I was soon teaching through the NAAUG Telecourse Program where our handouts were going out via email. At the second AU in Atlanta I got to do some face time with board members and those in the Education and Training Special Interest Group or SIG as they were called. This was my first occasion to volunteer in the AUGI booth.

**AUGIWorld:** Who bestowed the nickname “CAD Mama” on you and why?

**Donnia:** Whenever something went wrong, well, the CAD Manager got called on and that was me. One architect there would sing “CADMama to the rescue – Go CADMama, Go CADMama” to the tune of the song, “Jim Dandy.” He was the first to call me that.

The name was further circulated by another guy I worked with on the AUGI Guilds [precursor to the AUGI Forums] who talked about having a CAD Mama to work with. I embraced it and even have it on my license plate. The frame around my license says “My other car was designed in AutoCAD.”

I don’t know if I would say I drank the Kool-Aid...actually, I think I might have been one of those mixing the Kool-Aid!

**AUGIWorld:** From the little anecdotes you have shared (see sidebars), we now



know more about the fun side of AUGI. But we also appreciate that AUGI is more than just a networking club. What in your opinion are some of the most important professional benefits an AUGI member receives?

**Donnia:** I feel that being an AUGI member shows initiative in a person to reach out beyond just doing a job. It is different than some memberships where your employer almost requires you to join an organization.

AUGI, on the other hand, is something that someone has to choose to do. Having “AUGI membership” listed under professional affiliations tells me that this person is interested in what they do. They take steps to increase their knowledge—whether they just get the *AUGI HotNews* or other publications, or are active on the forums, or take AUGI Training Program (ATP) classes. They have shown that they want to increase their knowledge. When I think about offices that I visit or that I have worked in it is always the AUGI member that is the “go to” person when a question needs an answer. Because of this, an AUGI membership can say a lot to someone reading a resume.

**AUGIWorld:** In your years of experience as an AUGI member, what are some of the key areas of growth you’ve seen in this organization?

**Donnia:** Our publications have grown so much over the years. When I first came onto the Board of Directors every board member was required to write an article for AUGI’s *WorldView* magazine. In those days, you were not just a board member. You were a chair of a Special Interest Group (SIG). So you were representing a portion of our organization. Since there was only AutoCAD at that time we all used the same software but we might do different things with it. As a SIG Chair you would write an article based on your field.

One time, AUGI volunteer David Harrington offered to help the Local User Groups that did not have a newsletter. This is when *PaperSpace* was created. David would collect articles and put together about a five-page document that was blank on the back. Any Local User Group could request the *PaperSpace* PDF that was created and create their own newsletter by just putting a cover on the back and mailing it.

I had a spot in that publication—an article from the local newsletter I wrote would be placed in *PaperSpace* every month. You can still download *PaperSpace* under our

## Buy some AUGI Merchandise... please!

At AU in 2000, AUGI introduced the online AUGI Store. Only a few items were selected by the board to be put in the store initially. David Kingsley was the board member who presented the goodies at AU. It went sort of like this:

David says, “Anyone here ever use a mouse? Well you need an AUGI mouse pad. Any of you drink coffee? Well you need an AUGI coffee cup.” Things were being shown off by David as he introduced them. Nice pauses and some good flare on David’s part to add a hint of drama. But what came next had the whole audience roaring with laughter.

David paused ever so slightly. I knew what item was coming up next so it really had me wondering how he would introduce it. “Anyone ever do AutoCAD naked?” I about died looking out at the audience at all these guys’ hands going up. The mental image was too much. I turned and right beside me on the stage with the other board members was John Gibb, who was holding up his hand real high. Now there is a mental picture I really did not want burned into my brain!

Then I saw Carol Bartz, then CEO of Autodesk, sitting in the very front row, doubled up with laughter. So it did take a little longer to introduce an AUGI T-shirt than it did a mouse pad or a mug, but it was well worth the laughter!

Publications and *WorldView* section of [www.augi.com](http://www.augi.com). There you will find my “SMAUG Alert” articles.

I also think that *AUGI HotNews* is one of the best ideas that AUGI ever had. This means of contacting our members monthly keeps some members coming back to the website, I believe. Having an associated AUGI Forum for discussion of individual articles gives our members another means of contacting each other. Any contact we get with each other is a way of learning from each other.

From these early publication to the *AUGIWorld* magazine was a huge jump. Now with the new *AUGI/AEC Edge* magazine we have a choice. We can now see only the types of articles that we choose.

At one time AUGI had a slogan, “Educate, Enhance, Enlighten, Empower.” I think that the board members from the NAAUG days really tried to reach our members with the “4-Es” in many ways. I have seen the Telecourses turn into the AUGI Training Program – ATP. Using the Forums for communication for our classes can be viewed by all in the class and then archived for others at a later date.

Another great change has got to be the AUGI Forums. We tried a support connection using an email method (the AUGI Guilds), but you had to subscribe to those. This meant that you had to know that they were even there. The Forums are much easier to deal with. Being able to come in as a new member and just go to the Forums and do a search can be one way that AUGI immediately gives members just what they came to AUGI about – answers. Sure beats the way we used to connect. Anyone remember having to have a CompuServe account to be in touch with AUGI?

One big change that AUGI made was to cease taking dues. Now you would have to know that I was the treasurer at that time and I was REAL worried about the dues issue. Our membership had never been over 10,000 in a given year. If you did not pay your dues you were not a member the next year. When we opened a new database in 2000 and started the free membership there was an explosion of members. Our growth shows that the board back then made the right decision.

As for one key area of growth, just take a look at Autodesk University. It is not an AUGI event now, but it was the idea of an early group of board members. I believe it was LeAnne Thurmond who was the AUGI president the year of the first AU. A lot of credit goes to those board members who took it upon themselves to turn our annual meeting into such an event.

**AUGIWorld:** Over the years, you’ve held a number of spots on the AUGI Board of Directors. What were your various titles and which position was your favorite (and why)?

**Donnia:** The first position that I was elected to was President Elect in 1995. At that time, President Elect was appointed during Autodesk University. As President Elect, I was to move into the President position the next year. So in just my second year on the board I was the President. I have also held the position of secretary, treasurer, and general board member.

My year as president had its ups and downs for sure. One joke that seemed to always come up when I was president was someone saying, “Donnia, stand up!” to which I would always reply, “I AM standing!”

See, the year I was president, I think that everyone on the board of directors was over 6 feet tall except for one member.

There were some issues within the board that caused us to completely overhaul the election process. The following year the election was moved to the web and we also changed the election process so that the board members appointed the president themselves. We also changed the president's term so that instead of a president serving from AU to AU, the term was changed to the calendar year—January through December. This meant that my term was not a year, but was 15 months long.

The biggest change when I was president was the name change—from NAAUG to AUGI. I was the last president of NAAUG and the first president of AUGI. The base plans for the change were all done the year I was president-elect under then-president Dave Espinosa-Aguilar. The name change was mostly to reflect our growth. We already had members from all over the world mailing in their dues at that time.

After almost six years on the board came the biggest change for me as far as my AUGI involvement goes. I had been around with the board working with several different groups of personnel at Autodesk. They had a team whose job was to oversee the User Groups. It was during my second year on the board that we were lucky enough to get Lynn Allen as the head of the Autodesk User Group team.

It was in 2001 that the big change came. Autodesk was disbanding the User Group team they had and so AUGI had to figure out some way of working things out for ourselves. We no longer had someone paying the bills, collecting the dues, ordering t-shirts, getting articles in and processed for *WorldView* (our magazine at the time), handling the board of directors meetings, running the AUGI booth at AU, and on and on. Autodesk gave AUGI money to go hire someone to help with all this and more. That is when I resigned with about six months left of my last term and was hired as the Logistic Liaison.

This was supposed to be a part-time job. Many a week I would be working 20-30 hours for AUGI after I finished my "real" job. I had never worked so hard for AUGI in all the years on the board. Over the years this job just kept growing and growing. After five years of doing this I retired. AUGI had partnered with a marketing team that had taken over my contract and was helping with the development of AUGI and my tasks were taken over by several of their staff. So I was finally out, right? Not true. After nine months of retirement

I was asked to come back on the board to help finish out a term of one of the board members who needed to step down. So I got to retire again after another year on the board.

I have never left AUGI even after retiring twice. I still volunteer to help out with membership issues. I feel that this is one of the most important jobs I have ever done for AUGI. I take care of things when folks can't log in. Maybe their membership confirmation got caught in spam. Could be that someone just needs to know how to join. There are a variety of reasons



that someone would contact me at membership@augi.com. I get several emails a day to this email address. They are the ones that I go to answer first. I fix things for people. I get their membership validated or remind them of their password. I feel that this is usually the first contact that someone will have with AUGI and I want to get to these as soon as I can and I want to make sure that I get things taken care of quickly. I feel this is the face of AUGI that

they first find and I just want to make sure it is a happy one.

**AUGIWorld:** What's the best piece of advice you have for brand new AUGI members?

**Donnia:** I hear from a lot of members that they joined AUGI because they needed help with something and someone has told them about the Forums. You are not alone once you start your AUGI membership. You are probably not the first one to have that CAD problem that prompted you to become a member. Go ahead and search the forums to see what others have come up with for that particular little problem of yours. I have a tendency to search for the answer and then after reviewing what is out there I may have to ask after that. Don't be afraid to go to the Forums and ask questions. The only dumb question is the one you do not ask. You will NEVER get an answer that way.

Next, don't think AUGI is just the forums. Check out the ATP, publications, and product communities. Look into the archived ATP classes—you never know what little jewel you might dig up in there. Our archived publications are at your fingertips as well. Go exploring!

Also, members should regularly go to the "My AUGI" link on the top of the website. This is where they can keep up with their contact information. They can change their email address, password, mailing address, etc. anytime they need to. They should

## Sweet Talkin'

For years I was responsible for the AUGI Daily Bulletin at AU. For those who were at AU when it was held at the MGM Grand you well remember that LONG hallway. I would have to head down to the AU offices to get the Daily Bulletin and make sure that they got passed out to all the classrooms. So for years I had a paper route every morning at AU! While heading down that hallway I would usually strike up a conversation with folks along the way.

"Is this your first AU?"

"How have your classes been?"

"You are awfully early to breakfast."

"Could you help me out just a little bit?"

"Aw, come on, it won't take but just a little bit of your time."

These phrases usually started or ended with "dear" or "sweetie" or "honey."

Now for those who truly know me they can read those lines with the deep southern drawl that I can really pull out if I need to. And those who truly know me will tell you that when the accent gets thick – RUN! This usually means that I want something from you and I am pretty sure I am going to get it. Man, some mornings those long walks were like fishing in a barrel. I could get those bulletins delivered in no time with three or four helpers.

I do remember one person I pulled that southern charm on just to get them to hand out tickets at the door of the annual meeting. Once I get my southern charm wrapped around you it might be difficult to get out of it. I know it was for that ticket master, but then John Clauson turned out to be one of the best presidents AUGI ever had. Many a board member can tell you how their first involvement with AUGI at the booth or AU began with me calling them "Dear."

## Help me Donnia

Being recognized at AU is something that I have gotten used to. Everyone knows the “CAD Mama” or just “Donnia.” Lynn Allen and I have laughed that she is only known as “Lynn Allen” and not “Lynn.” It is also almost always pronounced as if it were one word: Li-Nallen. She also brought it up to me that I am known as “Donnia” and not “Donnia Tabor-Hanson.” I get one name like Cher and Madonna. But I have been recognized as someone that should have all the answers no matter what the question. Over the years I have been asked a lot of questions at AU, but one really stands out for me.

I was walking in the main hallway of the conference area at the MGM Grand where someone came up and grabbed my arm. This gentleman was flustered to say the least. He had just got off the phone with his wife and she was at the hospital ER with their son back home. They had changed insurance recently and the husband had the only insurance card with him. He needed to get it faxed to the hospital immediately. Because of the work I did on the AUGI Daily Bulletin I was familiar with the AU offices and staff members. I got him back to the office and got the card faxed right away. This gentleman just knew that CADMama would be able to help him.

never just start a new membership because they have a new email. It should be one membership per person! (Did I mention I have been volunteering for membership@augi.com for MANY years and duplicate memberships bug me???)

**AUGIWorld:** Now turn the tables and tell us what’s the best advice you ever received from a fellow AUGI member.

**Donnia:** That has to be the advice to run for the board and it came from “lower case dave” or “dave e-a” also known as dave espinosa-aguilar. (You will have to talk to him about that lower case stuff. LOL) It was at the AUGI annual meeting at Autodesk University in San Francisco 1995. At that time the AUGI board was elected at the annual meeting. There were nominations from the floor, speeches, and then a vote. Folks were coming up saying things like, “I have been using AutoCAD for a year,” or “I would like to have free software,” or “Free trips to Autodesk headquarters” so “vote for me.”

dave e-a was slated to be the president the next year and he stood up and looked around the hall. Once he spotted me he motioned for me to come up there. He told me that I had to run because these people had no clue as to what it took to run a user group. dave had known me from my work with my local user group and what I had reported back to NAAUG about it. I had also gotten involved with the NAAUG telecourses. I got up and spoke about my involvement with SMAUG, the telecourses, and helping out as a volunteer at the AUGI booth. I did not mention how long I had been using AutoCAD.

dave said I won by a landslide. And, oh yeah, I have been using AutoCAD since version 1.4. (Yes, there is a decimal point in there so as not to be confused with Release 14.) And for the record, at no time

on the board of directors was I ever asked to name a system variable or how to draw a polyline.



**AUGIWorld:** Do you have any caveats or cautions for brand new AUGI members?

**Donnia:** AUGI is a large organization with a lot to offer. Take little bites at a time. Get started with a Forum search to find information. Maybe make the next step posing a question to one of the forums. You can then maybe answer a question on the Forums. Don’t limit yourself to our Forums, though.

Check out the Education section. Did you know you can go take a class online for free? You can peruse past class material

including the class handout and archived forums for these past classes. Prior to Autodesk hosting AU Online for the past few years, AUGI hosted handouts from Autodesk University. Some of this information is still relevant. AUGI also has a partner in the CADLearning company as a great supporter of AUGI. CADLearning offers free classes to AUGI members.

Over lunchtime you can explore some of our publications. By hosting our former magazines and other publications, AUGI provides a wealth of articles for our members. Many of these are in PDF form and can be downloaded. As an AUGI member you may be called upon at your office to provide that lunch-n-learn topic. AUGI publications can give you many ideas for your next presentation.

One of the things I find many AUGI members doing is going to AUGI because they have heard about the Forums and how they get good answers quickly. Well, don’t let the Forums be the only interface you have with AUGI. Become an AUGI explorer!

**AUGIWorld:** What are your general thoughts about AUGI approaching its 20th anniversary?

**Donnia:** WOW! From a few hundred folks gathering for a meeting back in 1990 until today I have witnessed so many changes. Some would find it hard to believe but I remember when we did not have a website! It was amazing how just needing to reach out and find help led so many to get to the CompuServe site. It was like an underground movement that just kept growing.

I think the one thing that truly stands out to me after all these years is the phrase that showed up on the back of one t-shirt and became the theme of AUGI for years.

**Educate! Enlighten!  
Enhance! Empower!**

It is as true today for AUGI members as it ever was.

## Real-life issues

AUGI members are a great support and one incident really stands out for me. When my youngest grandson Knox was born he was diagnosed with Congenital Hypothyroidism. I just put a message out on the AUGI Coffee Without CAD (CWC) Forum asking for prayers and support. (See “Baby Having Trouble” for more on this.) CWC is a Forum area for everything NOT related to work. I got so many responses and felt the real meaning of “AUGI Family” that it warmed my heart. Many a member has started a thread there for fun, prayer, or just to satisfy their curiosity. Every year around Knox’s birthday I try to update everyone on how he is doing. This year there is a picture of him on his fourth birthday present – a bicycle. Knox was inducted to the CWC Right Royal Brotherhood, which is a fellowship of guys that hang out on the CWC. Some things from this Forum message have been printed and are in his baby book.

# Snap! Desktop Content for Inventor

For many, using Autodesk Inventor® Content Center has been a failure or at a minimum, not a great experience. Many factors have contributed to various levels of dissatisfaction. For some, older hardware or slow servers have provided a bad experience. For others, configuring for Content Center has been difficult or time-consuming. Inventor 2010 can change all of this for you!

Autodesk has provided two paths for using Content Center in Inventor 2010. For organizations that have multiple Inventor users, the Autodesk data management Server-Based approach is still the best way to deliver content. For individual users, or those users laboring under older and slower computer systems, a new product has been introduced. Desktop Content Center is the ticket that will enable all users to efficiently utilize the power of Content Center.

## The benefits of Desktop Content Center

The primary benefit of using the new Desktop Content Center is that it does not carry with it the overhead of SQL Server technology. This means that it is ideally suited for older systems and laptops where portability is a requirement.

This also means that installation is a snap. No longer do you need to have all your ducks in a row during installation, in fact, it is nearly transparent. If you do not have a need for creating and storing custom content, it can be also used for smaller, multiuser installations.

## When to use Server-Based Content Center

Server-Based Content Center should be used in multiuser environments, or when shared Custom Content Center components are created and used among many Inventor seats. When custom content is added to the Content Center, a Server-

Based system simplifies synchronizing all the new components, making them available to all users.

Server-Based content is managed through the ADMS console. This interface is the front end to the SQL databases, and metes out the content to individual users when requested. ADMS requires the installation and use of SQL Server and Internet information services at the server level. In many corporate installations, this is normally already installed. SQL Server drives access to the content, while Internet Information Services provides direct access via HTML to individual users.

## How Content Center works

Content Center is very similar to using iParts, both of which are table-driven parts. The difference between the two is that with Content Center, the table-driven part is stored along with a family table in a Content Center database. If you are using many aspects of the design accelerator or frame generator, or routed systems, then any custom parts needed must be stored within the Content Center category associated with those advanced features of Inventor.

In addition, Content Center permits rapid placement of the same part without reverting back to a dialog box each time. This makes placing multiple parts much more efficient.

Both Content Center and iParts generate members or “children” as static solids, and then places those members in a read-only location. When the exact same named part is placed again, Inventor first looks in that destination location to see if an identically named member is present. If so, the database does not generate a new member, but instead links to the existing member.

Because of this behavior, it is essential to place the generated members in a location that is accessible to all users. If this is not properly done, then you will have multiple instances of the generated members scattered everywhere, with the possibility of file resolution errors.

## Utilize good data management practices

As always, a good data storage structure provides for speed, stability, and ease of reuse of Inventor files. In order to provide fast resolution and easy access to all parts, including Content Center, proper data structure and project file design is essential.

Use of the single project file approach is recommended to provide the greatest flexibility and ease of use. This approach utilizes three main folders located at the same folder level.



Figure 1: Suggested Data Structure

In Figure 1, the Content Center folder will allow creation of subfolders where generated members will be stored. The Designs folder and any associated subfolders will be used to store all of your unique design parts, assemblies, drawings, and presentations. The libraries folder is intended for storage of iParts and their generated members. Both Content Center and Libraries will be designated in the project file as Read-Only folders. The local folders on each user hard drive replicate Server-Based folders identically.

## Configuring Desktop Content Center

Configuring your system for usage of the new Desktop Content Center starts during installation of Inventor 2010. It is common practice to overlook the configuration tab at the top of the installation dialog. Every installation of Inventor should be done with care, and selecting manual configuration is a good start.

During this configuration you will be given the option of using Server-Based

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Content Center or Desktop Content Center. If you choose the default Desktop Content Center option, you will be directed to choose the specific databases that you wish to use.

Once you have installed Inventor and all of the needed Content Center databases, you will then need to configure your project file to use the new content.

With all files closed, access Projects in Inventor. At this point let's assume that you have created a new project, designating the "Designs" folder as the main workspace location. Let's also assume that you are using the locations (local or server) that you have specified in Application Options >> File tab.

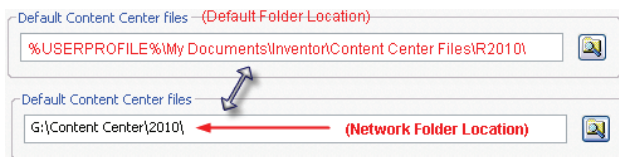


Figure 2: File – Application Options

If you are sharing your files, then the File tab > Content Center pointer should represent a network location.

The last step in the process will be to configure your active project file for the specific Content Center databases that will be in use. If you have selected Desktop Content in Application Options, then you will be configuring the Desktop databases. Once you have selected the desired databases, and saved the project, you are ready to go.

## Can I use both?

The beauty of Content Center in Inventor 2010 is that you are not limited to choosing between Desktop Content and Server-Based content. This means that you can use ADMS Server-Based Content at the office, and Desktop Content when you're on the road.

Inventor 2010 provides for easy transfer of custom libraries between both environments.

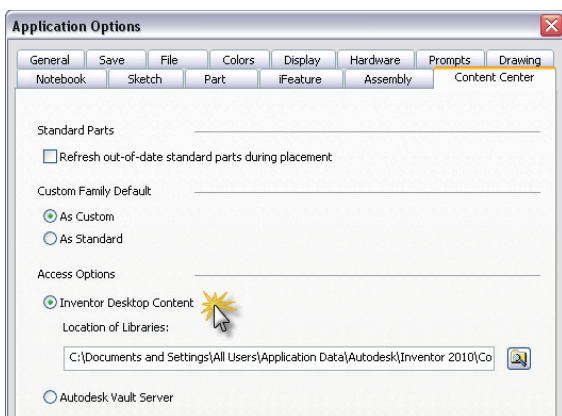


Figure 3: Desktop Content – Application

vironments. This is accomplished through the configuration menu. The configuration menu has been changed in 2010 to accommodate both database pools, as well as enhance the configuration experience. Within the configuration menu, you can create new Read/Write Desktop Content databases, select

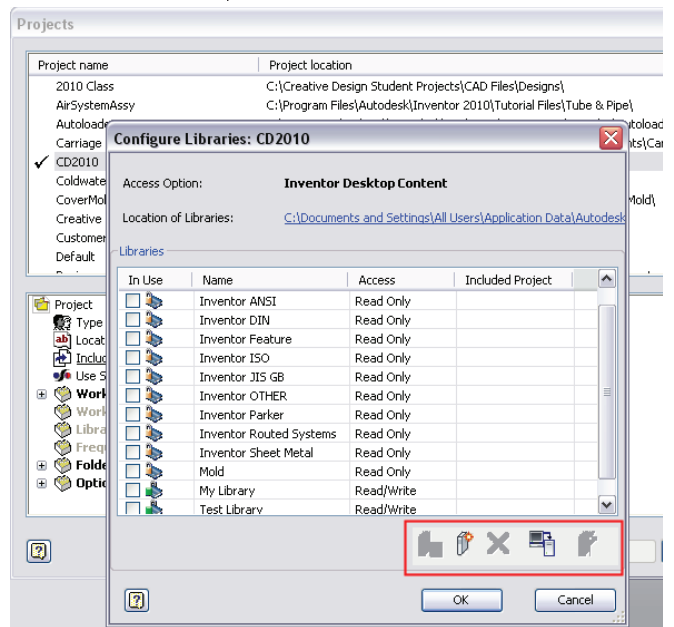


Figure 4: Configuration – Projects

the active libraries for use with the current project, and transfer databases from the Desktop to the Server-Based environment or the reverse.

## How do I create Desktop custom content?

Custom content is created in Inventor 2010 in exactly the same way we created content in Inventor 2009. While the creation of the custom read/write database has been moved to projects, custom content is created using the Publish options as well as the Content Center editor. In 2010, the Publish options are shown on the Manage tab. All of the options have been placed in a fly out tab, next to the Content Center editor icon for easy access.

## Will Content Center work for me?

If you have tried to use Content Center in previous versions, but found it slow and cumbersome due to hardware or networking issues, then now is the time to revisit the use of this able resource. Moreover, Desktop Content makes it easy for laptop users to have the benefits of Content Center when they're away from the office. Simply transfer the server-based content to your laptop, and you're ready to go. The ability to have both environments coexisting makes it all possible.

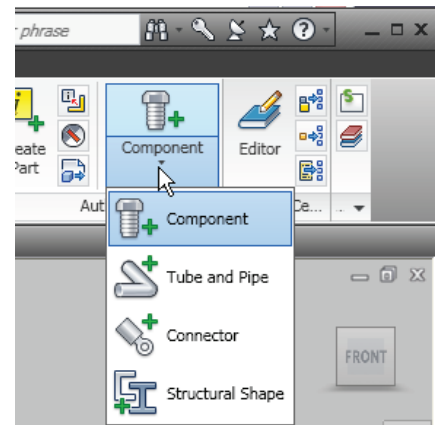


Figure 5: Manage – Publish/Edit tab



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Dennis has been training and supporting manufacturing customers with Autodesk products since 1987. He is also the author of Creative Design With Mechanical Desktop™ and Creative Design With Autodesk Inventor™. He returned this past year to Autodesk University 2008 as a seventh year Power Track instructor.

Dennis is a moderator for the AUGI manufacturing forums as well as an AUGI wish list reviewer/administrator and columnist. Dennis performs live, Web-based training and courseware development at Tekni Consulting LLC. A new book, Creative Design With Autodesk Inventor, is currently in production for late fall 2009 delivery. Dennis can be reached by email at: [djeffrey@teknigroup.com](mailto:djeffrey@teknigroup.com).

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# Perform Detective Work with Navisworks Manage

In the 3D world of Autodesk software, one can argue that Autodesk® Navisworks® Manage may be the single most important software application in terms of understanding the complications of a design and the creation of a collaborative environment.

The creation of project animations, markups of various views, and the combining of various design files including Autodesk® Revit®, AutoCAD® Civil 3D®, and point cloud scans into a common model are all possible within the software.

These features all complement the traditional functionality of Navisworks Manage, which is called the Clash Detective.

## Clash Detective

As the name suggests, the Clash Detective inspects the three-dimensional model for any location where a collision of objects may take place.

In terms of real-world collaboration, this is more than just objects from the same program; in fact, Navisworks is designed to allow project teams that utilize very different software solutions to collaborate within a 3D environment.

For example, a building created in Autodesk® Revit®

Structure 2010 could be coordinated with an AutoCAD® Architecture 2009 building model. The mechanical systems for this project could then be designed in AutoCAD® MEP 2010 while the civil engineers utilize AutoCAD Civil 3D for the creation of the site.

Of course, the Interiors group could be performing its work in Autodesk® Revit® Architecture 2010 while the rest of this is taking place because Navisworks will enable all these programs to have their information featured in the same 3D model environment.

Ultimately Navisworks Manage is all about design collaboration and the elimination of costly mistakes, and this can be expedited by utilizing the Clash Detective tools.

## Clash detection basics

Using Clash Detective is easy. By selecting the objects you wish to detect on the

left side of the menu and then selecting the objects you want them to be checked against on the other side of the menu, you can specify your clash detection sets.

With the click of a button it will generate a listing of results on the screen which can then be generated into a report or can take you to a view that shows where the clash is taking place.

The clash detection process is not limited to a “standard” intersecting of data. There are three different types of clashes that can take place, starting with a Hard Clash.

The Hard Clash is the traditional clash where two physical objects touch or cross

der to generate more refined results. Items on the same layer or in the same group or block can be filtered out from the rest of the results. In addition, items with the same “snap point,” which potentially could register as a collision (such as a sink attached to a wall), or items contained within the same file can be told to be ignored for purposes of the check.

## Just the facts...

As with any good detective, documenting, reporting, and discovering the facts are what Navisworks does best. The results generated in the Clash Detective can be renamed and reordered based on your needs and the current status of these clashes can then be adjusted.

For example, a clash can be categorized as New or Active (existing); Approved (the clash is OK); Resolved (the clash no longer exists); or Old (it no longer applies). This enhances our ability to generate status reports based on the current status of the clash within the model.

To further document the facts, Navisworks “views” can be formatted based on the information they contain in order to see appropriate clashes and to ensure that they are displayed properly.

To automate this process, Navisworks contains view settings tools that will do the work for you instead of forcing you to adjust graphic and view settings properties. The Auto Reveal and Auto Zoom tools will automatically focus on the objects affected by the clash; Highlight All, Dim Other, and Hide Other will allow us to emphasize the objects we wish to see.

Once the view settings are selected, Save View locks them in so they can be revisited, marked up, discussed, and printed.

Since we are discussing the facts, we know that not all facts can be seen in a pretty picture or in a table. As a result, Comments can also be added to any clash that occurs. By right-clicking on the name of the clash, an Add Comment option will appear. By selecting this, you will be given the opportunity to type any comment that

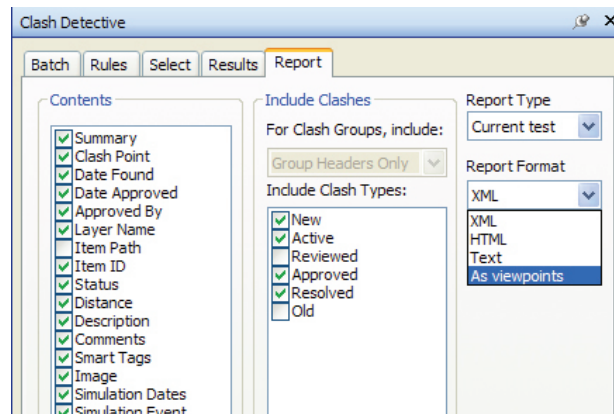


Figure 1: The Clash Detective interface

each other, such as when a section of duct interferes with a length of pipe.

The next clash type is an area where Navisworks begins to distance itself from other programs: the Clearance Clash. By setting a tolerance around an entity, any object that crosses into that tolerance range will place an alert on the Clash report. This will detect such things as insulation on piping before it is modeled.

It also could be used when performing code compliance checks. For example, does anything impede the turning radius of a vehicle or a wheelchair?

The third clash type is Duplicates, which detects when two identical objects occupy the same space, even if those objects were generated in two different software applications.

It's important to note that clash detection rules can also be put into place in or-



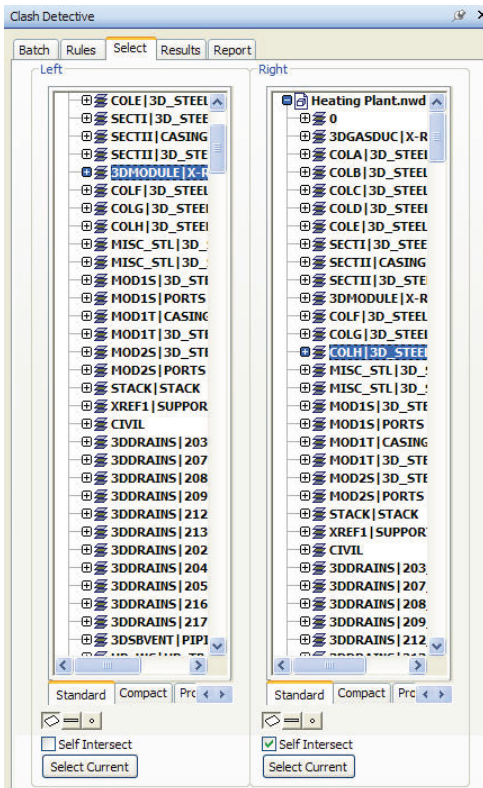


Figure 2: Clash results and current status

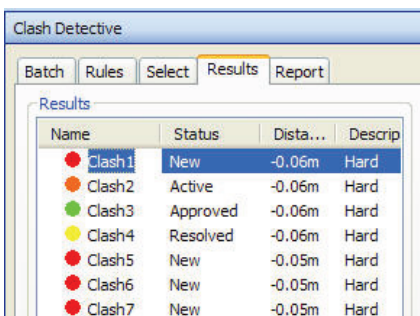


Figure 3: Creating a Clash report

you have about the condition. Of course, these comments can also be viewed when examining this collision on screen or from a generated report.

## Documenting the results

The Clash Report can contain virtually any information that you wish to document related to a clash/interference condition. The setup of this report can then be saved to be standardized across the markup and review process.

Another useful feature in these reports is the ability to export/attach the views created by the collision detection into the report. Because this image is attached to the report, potentially highlighted with comments, the communication of the issue will be more easily conveyed with less confusion. These reports can then be generated in an XML, HTML (webpage), or Viewpoints, which allow for comments to be added to your report.

The HTML functionality can be particularly useful for those who only have access to documentation via devices such as their cell phones. Go online via your phone, click on a webpage, and review the issue within minutes of the clash being detected in an office hundreds of miles away.

## Laser scan data clashing

One of the more intriguing uses of Navisworks is a process which is rapidly becoming more affordable—the use of a laser scanner. The laser scan data can be brought into Navisworks in the form of an object called a point cloud.

This point cloud (a collection of “points” which a scanner has generated within the software by scanning the walls, floors, and ceiling with a laser) can be used to detect a clash in a non-traditional way by assigning specific tolerances around each point. Thus, it is no longer required to import a mesh when using cloud data or to convert these points into actual objects. Instead, Navisworks can perform its clash detection just by using the actual points of the scan.

## SwitchBack

A useful tool in the Navisworks arsenal is the SwitchBack feature, which will step you through the clash results while also taking you to the appropriate CAD application to review your model.

For instance, if you notice a clash in a hospital complex, it might be difficult to immediately determine where this clash has occurred due to all the similar, repeating rooms in the complex. SwitchBack eases this transition by launching the appropriate CAD application and immediately taking you to the appropriate location in the model.

Once you are in your CAD application, you can revise the situation and immediately move onto the next clash issue.

## Time-based clashing

The Clash Detective also has the ability to work in conjunction with the TimeLiner feature to generate clash detection reports on the fly.

The TimeLiner feature is used by Navisworks as either a standalone application where project schedules can be entered or by importing schedule data from software applications such as Primavera or Microsoft Project. By doing this within the Navisworks environment we can coordinate the site and construction staging within the 3D model regardless of the software package in which the model was originally created.

This project sequencing functionality can then be used to refine the timelines within the project and aid in the coordination between the trades, supply delivery, and equipment onsite.

The TimeLiner and Clash Detective functions work in conjunction by documenting where the different objects and trades will be occupying certain areas at certain times. If these trades are mistakenly scheduled to occupy the same area at the same time or materials are scheduled to be delivered and stored at the same location, the Clash Detective will warn the construction manager that a conflict is set to take place at that time and location. As a result, costly time-related mistakes can be averted before they happen in the field.

## Speaking their language

In a world of standardization, confusion about file versions and IFC exports interoperability (the ability to share data between software programs) is one of the most talked-about issues in the construction trades. This is where Navisworks shines, bringing data from a diverse group of software programs into the same environment. While the project teams might be working in totally different models and environments, Navisworks understands this limitation and is designed to aid the coordination of these different trades.

Navisworks handles this transition best when utilizing the Clash Detective tools inside the Manage version of the program. The increased and improved communication makes a huge difference when it comes to RFIs and change orders from the field. Navisworks should be in the computer of anyone who needs to coordinate and eliminate these kinds of issues.

On a personal note, when I was working for a construction/design firm, we saw Clash Detective save a \$50,000 problem from occurring in the field when a group of structural members hadn't been sized (length) properly in the documentation. So I'm not just a Navisworks “believer.” It has had a very positive financial impact for my own employers.



Brian Myers is an applications engineer for Seiler Instrument in St Louis, Missouri. He's been using Autodesk products for 20 years in a variety of industries including residential and commercial design. Brian can be contacted at [bmyers@seilerinst.com](mailto:bmyers@seilerinst.com) and has a Twitter account at <https://twitter.com/BIMfacts>

# Using Layer States in a Multiple Discipline 3D Model

In the MEP world, line weights play an important role in the creation of construction documents, which help contractors obtain bids and price quotes from subcontractors. Construction documents define quantities and materials required to construct a project. They also define the roles of the construction team members.

Layer States are useful tools in AutoCAD® that can be used to help create better construction documents. A layer state is a combination of layer property overrides that can be saved, documented, and applied to model space, paper space, and within paper space viewports.

Layer states allow you to load and unload a combination of layer settings quickly and efficiently. Settings include on/off, frozen/thawed, locked/unlocked, plot/no plot, color, line type, line weight, and plot style.

It is important to note the “property override” comment above. Property overrides are a method to display objects with different property settings without changing their byblock or bylayer properties.

with mechanical, electrical, and plumbing objects and will use layer states to control layer colors. Let’s assume we are in a .ctb environment. For those unfamiliar with the term, a .ctb file is a color-dependent plot style table. When you change an object’s color you will also change its plotted line weight.

Most companies have a layer scheme that places certain disciplines of objects on certain layers. Mechanical equipment would most likely be on a mechanical equipment layer, electrical equipment on an electrical equipment layer, and so on. The main idea is to have everything in the model on its proper layer at the outset. Then create a layer state to override layer properties within a viewport. The override will help adjust the

ing, you want everything that is not related to mechanical piping to take a back seat. Likewise, if you want to emphasize electrical equipment, you want everything that is related to electrical equipment to stand out. When we are finished, we will have layer states that give priority to the objects of each discipline.

Name	Space	Sa...	Description
Electrical Dominant	Layout	No	Electrical Layers will st...
_Fire Dominant	Layout	No	Fire Protection Layers ...
_HVAC Dominant	Layout	No	HVAC Layers will stan...
_Mechanical Dominant	Layout	No	Mechanical Layers wil...
_Plumbing Dominant	Layout	No	Plumbing Layers will st...
ALL EXISTING	Layout	No	All new layers on existi...
TE - DEFAULT	Layout	Yes	TE layers prior to modi...

Figure 2: Discipline-focused layer states

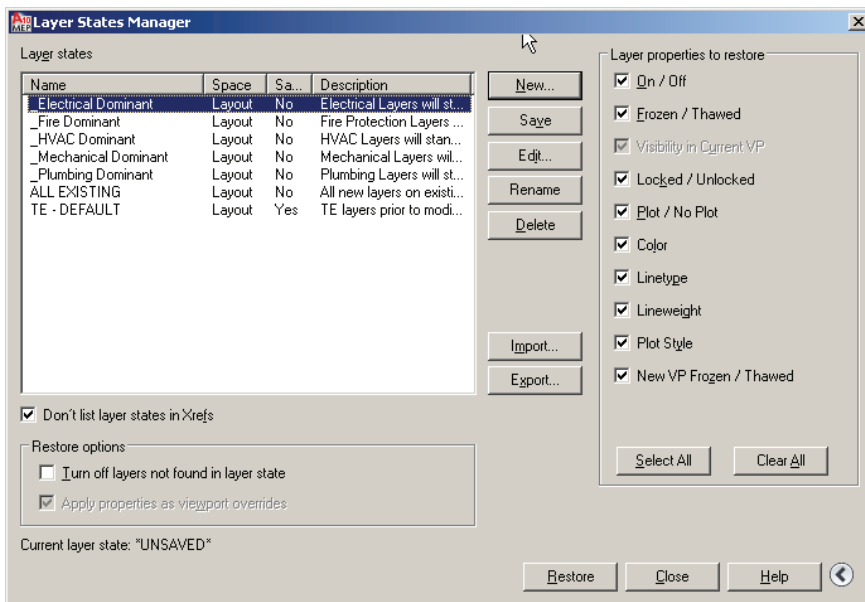


Figure 1: Layer States Manager

One of the uses of layer states will be explored in this article.

This example covers a single 3D model

plotted line weights that are used to represent each discipline. Remember, if you are trying to emphasize mechanical pip-

Before we get started creating layer states, let’s familiarize ourselves with the available options. Access the layer state manager by selecting the layer state icon within the layers panel on the home ribbon, or by typing “Layerstate” at the command prompt.

## New

This option produces the New Layer State to save dialog box. The layer state name can contain only alphanumeric characters and spaces.

## Save

This option is used to save any changes that have been made in the layer properties manager and the layer states manager. The changes will be saved to the current highlighted layer state.

## Edit

Editing is done through the edit layer state dialog box. Along with the basic layer edit settings you also have the option to add or remove layers from an existing layer state. Highlight the desired layers, then select the “add or remove” button in the lower left corner.

## Rename

This option allows you to rename an existing layer state. You may also slowly dou-

ble left-click a layer state name with your mouse to rename a layer state.

## Delete

Delete a layer state by highlighting the name from the list, then press the delete button. You can also press delete on the keyboard.

## Restore

This button is used to make a layer state active. Highlight a name from the layer states list, and then use this option to restore the selected saved layer state. AutoCAD automatically sets the current drawings' (on/off), (frozen/thawed), (locked/unlocked), (plot/no plot), color, line type, line weight, and plot style settings to those saved under the assigned layer state name.

## Export

Once you have created a layer state, it can be saved as a .las file extension. Each named layer state must be saved as a separate .las file. You cannot save the entire set of layer states to one file.

## Import

You can import a saved layer state from a .las file. You can also import layer states from a drawing, template, or drawing standards file.

## Layer properties to restore

These check boxes allow you to specify which settings you want to save with the layer state. In other words, with all the boxes checked, you save all the settings as they appear in the layer properties manager for each layer. On the other hand, if only the color box is checked, only the color settings of each layer as listed in the layer properties manager will be saved when the layer state is created. Therefore, if you are interested in saving only color settings for layer groups, it is recommended to uncheck the other boxes. Note that selecting a layer state through the ribbon drop down does not restore the selected state to the viewport.

## Turn off layers not found in layer state

This check box may be useful if you imported a layer state .las file into your drawing and the current drawing contained more layers than were named in the .las file.

## Apply properties as viewport overrides

Checking this box causes the layer property overrides to be applied to the selected viewport. This option is available only when the layer states manager is accessed with

in a layout viewport. When property overrides are applied to a viewport, affected layers are displayed with a light blue background in the layer properties manager, assuming the layer states manager is accessed when that specific viewport is active.

## Layer state within blocks and xrefs

Layer states saved with a drawing that is inserted into your current drawing as a block are added to the current drawing. Saved layer states that are contained in x-referenced drawings are not accessible from the layer state manager.

Now that we understand the fundamentals of the layer state manager, we can begin creating layer states. In this example, all layers and layer states are loaded into a single drawing. The first thing you want to do is create a default layer state. Having a layer state without any modifications will allow you to return all override settings to pre-modification.

Through paper space, enter a model space viewport (by double clicking inside the viewport). Open the layer state manager and select "save." Enter an appropriate name and description. It is a good idea to name the layer states so they are easily recognizable. For this example, we have chosen a discipline name followed by the word "dominant." This helps users understand the use of the layer state without having to expand or spend time hovering over the description field. If you intend to have the layer states default with a master template, it is a good idea to set the "default" layer state as the current layer state before exiting the drawing.

In this example, our drawing has a group of mechanical layers and a group of electrical layers. Let's create a mechanical dominant layer state. With the default layer state set (remember, this is done by entering a paper space viewport selecting "Default" and using the restore icon), open the layer properties manager and change all the mechanical layers to a bold pen weight color and the electrical layers to a light pen weight color.

If you are unsure which colors control which line weights, you can enter the plot dialog box and select the pen assignments edit box in the upper right corner of the "more options" portion. Save your layer

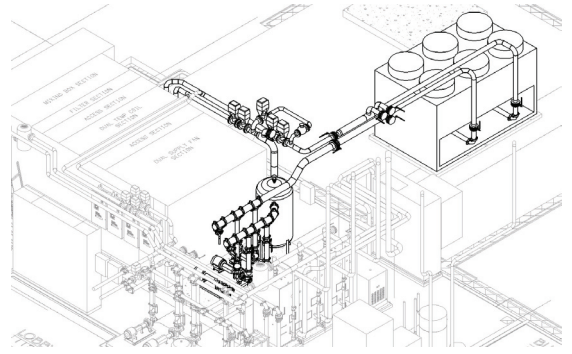


Figure 3: Mechanical Layer State restored

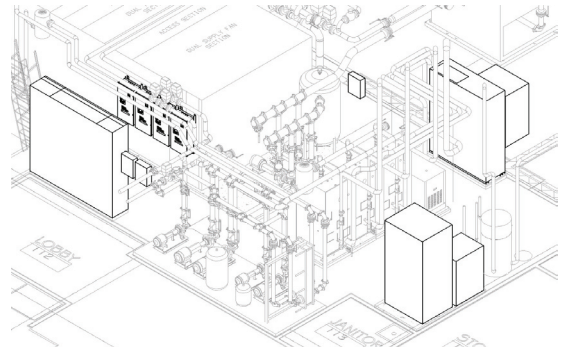


Figure 4: Electrical Layer State restored

state. Enter a name and description. For this example, we have chosen to save the layer state as "\_Mechanical Dominant." See Figure 3 for an example of this layer state in use.

Now let's create an electrical dominant layer state. With the default layer state set (remember, this is done by entering a paper space viewport selecting "Default" and using the restore icon), open the layer properties manager and change all the electrical layers to a bold pen weight color and the mechanical layers to a light pen weight color. See Figure 4 for an example of this layer state in use.

The information detailed above is a method for controlling line weight in a .ctb environment. The same principals and ideas can be applied in a .stb environment to achieve similar results. Depending on your intentions, you may want to control the on/off properties of layers or change certain objects to the color red. It's totally up to you. Once created, layer states will make that task automated and simple.



*Mitchell D. McComb has more than 12 years of experience in CAD and several years experience in mechanical, electrical, and plumbing design layout. He is ThermalTech Engineering's CAD Manager and IT guru. ThermalTech provides engineering, construction, and operations solutions.*

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