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AUGIWorld

The Official Publication of Autodesk User Group International

September 2012



11th Annual AUGI Salary Survey

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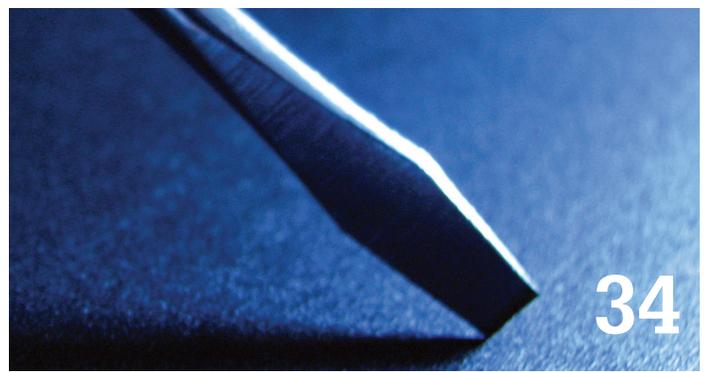


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Welcome, *AUGIWorld* readers!

This issue we bring you the perennial AUGI Salary Survey report! For 2012 we actually exposed more information than ever before in a salary survey. Melanie Perry once again surveyed thousands of AUGI members, collecting data, averaging sums, formatting charts, and listing facts and figures! It's a lot of work —thank you, Melanie!

Now what to do with this plethora of information? Simple... use it to your advantage! We publish this information each year around the 3rd quarter so you have time to review and figure out how to apply this information to your particular set of conditions.

Do you have the proper title for what you actually do each and every day?

Is your total compensation in line with industry standards for your role, skills, and location?

Are you missing out on valuable benefits that others are getting in today's world?

And most important— is there information in the salary survey that you can use to help get the salary you have earned and deserve?

Besides the salary survey, we have an array of technical insight and expert opinion articles. For this issue we suggested our content managers and authors do their own thing; wherever lies their passion would be just fine.

I encourage you to take your time absorbing the salary survey data, and then take in all the great articles throughout this *AUGIWorld* issue. There is something for just about everyone!

Until next month, happy reading!

David Harrington



Retaining Talent

In a previous article (May 2012 – “CAD Employee Hiring 101”) I talked about how to hire a new CADD technician, and in July 2012 Curt Moreno did another article titled “Employing the right Hiring Practices.” Both articles discussed hiring CADD technicians, but differed somewhat in approach. The first article discussed using a standard methodology to finding and hiring good people. The methodology covered creating a game plan to use for hiring before it is needed and then following that consistently when the need arises, adapting as necessary. By

planning ahead, like any business process, it keeps the actual hiring procedures from being painful and reactive when a position has to be filled. This article also focused more on finding a long-term employee rather than just filling a slot.

Curt’s article took a different approach and focused more on an immediate need to hire a CADD technician. This need was created by an existing position being vacated on short or no notice or a flood of projects with rapidly approaching deadlines. Due to this quick need, many steps in the “how it should be done”

Management

playbook were eliminated or shortened. The differences here could be summarized as proactive versus reactive hiring or as Curt summarized it as “Perfect World versus Real World.” Curt made some valid arguments on the need to quickly fill a position, but I believe that there may be some underlying reasons that the scenarios mentioned would require this approach. Some things to consider are the current planning, forecasting, and staff retention practices. As Curt mentioned, projects have deadlines, which mean they should have schedules and an understanding of staff resources.

Both articles had numerous things in common that ultimately would lead to a final decision on who to hire such as multiple interviews, testing, and staff/peer reviews. No matter which methodology you follow, the ultimate goal is to hire a good person and keep that person around. The steps and procedures indicated in both articles can be applied to most any type of position. It is not just for CADD technicians.

The key ‘take-aways’ from the May article were:

- Determine your need
- Create a clear and accurate job description
- Promote your position
- Screen your candidates (checklist, reasonable time, multiple interviews by various individuals)
- Make sure your final candidate is the right fit

So let’s assume you found and hired your new tech and he/she has turned out to be a rock star. The person shows up on time, if not early, and stays until all tasks are done. The employee is enthusiastic about helping others and learning new things, up to speed on new commands and tools, and gets along with everyone from the CEO to the receptionist at the front door. Wow—your extra work has paid off and you hired a real keeper. Hopefully, you have a few and perhaps many of these types on your staff, and the purpose of the first article was to help you achieve just that. So, the next question is: How do you keep them around?

People leave companies for various reasons, but the two most common are money and culture. Surprisingly, of the two, money is not number one. No matter how much employees make, at some point, the frustration, unhappiness, and/or lack of advancement will cause them to leave. The culture or day-to-day happenings at your company have a huge affect on keeping people both productive and happy. Just the act of hiring good people has an impact by showing that you care about the quality of your team. When employees see that you are selective in who you hire, it shows them that they were ‘selected’, not just hired to fill a slot, which will give them a sense of value right from the start. There are various things you can do to keep the good ones around and what follows are some descriptions of each. Not everyone would consider all the following to be “culture” items, so to put them in perspective, I offer the following definition from the Human Resources section of About.com:

“Culture is the work environment that you supply for employees. Employees are motivated and most satisfied when their needs and values are consistent with those manifested in your workplace culture.”

The following are some items that affect how employees are treated, rewarded, and how they interact in their work environment. These items are meant to address an employee’s needs and values. If the employee’s values do not match or are not relatively close to those of the company, then maybe the person is not a good fit. Hopefully, you got some sense of this during the interview process.

COMMUNICATION

From day one, make sure your team members (your employees or direct reports) know what’s going on with the company, division, or branch. Some tough topics may require a brief period to think about and form a game plan, but don’t keep news or events (good or bad) quiet too long. Maybe you feel that it isn’t as if you’re hiding anything, you’re just not sharing. For most, it makes no difference. People can be pretty intuitive and will know when something is up. If they do not sense it on their own, in this instantly connected world, they may hear it from an outside social connection or from other peers that overheard something. This is not how you want company information to be discovered or disseminated. Without all the details, people will piece together their own ideas about what is happening, just from the things they see and hear. In many cases, it won’t be anywhere close to the real situation. For an employee, knowing something is in the wind but not knowing what it is can create anxiety, fear, and eventually a lack of trust in their employers. Be open and address the good and bad as soon as possible.

If you have an “open door” policy, make sure that it is just that. If employees think that speaking up will carry repercussions, they won’t—and you may be missing out on some great ideas or useful feedback when it is needed. Remember that the key to communication is that it is a two-way process that involves talking and listening. If you are doing all the talking, then you are just telling or broadcasting, not communicating.

MAINTENANCE

Keeping the right people often means removing the wrong ones. Some individuals are just bad for your culture. These people are the whiners, slackers, and disengaged folks who bring down the positive atmosphere of your company.

• Whiners

Sometimes people whine because they don’t know how to voice their concerns or complaints or don’t think they can. When you see this or hear about it going on, address it quickly—don’t put it off and hope it will go away. The whining will just get worse and spread. Sometimes you will not be able to fix the issues or concerns the whiners have, but if you can’t, you can at least explain why something cannot change. This lets them know you care what they have to say and are willing to address their concerns when you can.

♦ **Slackers**

These people don't pull their weight or have become unreliable when it comes to meeting expectations. They seem to spend more time tweeting, facebooking, or chatting with friends online instead of actually doing work. Even though many have mastered how to look busy for the boss that occasionally comes through, their co-workers know the truth. Seeing this happen regularly causes frustration and disenchantment among the "doers" about putting out extra effort to make up for these production speed bumps—their slacker coworkers. When you see or hear about this, pull the offenders aside and chat with them or give them a warning. If they don't change, remove them as you would a tumor—before it spreads.

♦ **The Disengaged**

These folks have lost their drive or interest in what they do, either from boredom or lack of motivation. These are the folks who throw out the zingers such as "Not my job," "Not my problem," "Not my department," or "I'm off the clock" when asked for assistance. When you get a few of these folks in the mix you have the potential, as with the slackers, to frustrate and demotivate your star players. It's true that star players can perform anywhere, but they prefer to do it in a positive environment. When one of your employees needs information or help to get something done or, even more critical, when a customer is looking for answers, the last thing they need is a "It's not my job" or "I'm off the clock" kind of answer. You need team members who are willing to do what it takes to get it done, or at a minimum, point others in a direction that keeps them moving forward.

If you have employees who fit into any of these classifications, find them and see if something can be done to motivate and change their current attitude toward their job. If not, set them free to pursue their interests elsewhere!

REVIEWS

Reviews are important and there are a variety of types. While all are good and serve a purpose, some are clearly better than others, depending on an individual's position and industry. For example, in the AEC industry, the most common is the annual review. One bad aspect of this type of review, which I have seen at almost every company, is that the promised annual review is rarely an annual event. Some people go for years without a review; employees may even get a raise or bonus, but no review. This sets a bad precedent. The expectation will become that employees get a raise each year, and there is nothing tied to why they got it. Some may be fine with that—these are often the disengaged or the slackers (no chance of having to face the music). Those who don't get a raise or bonus or feel that what they do get is too small become your whiners.

I do not like annual reviews for various reasons, some of which I'll discuss in Rewards later in this article. The once-a-year summary is inadequate for keeping a real-time connection with the people who keep your company moving. Personally, I prefer bi-weekly one-on-ones. I've used these in the past and they have

worked very well to increase motivation and keep me connected with members of my team. If you not familiar with one-on-ones, the following is a brief description.

A One-on-One is basically a weekly, 30-minute scheduled meeting between a manager and a team member. The meeting is typically done at a consistent time every week. If every week is hard to do, try every two weeks—but don't go over one month apart.

The meeting needs to be structured to include time for both the team member and the manager to speak. A typical meeting allows 10 minutes for the team member, 10 minutes for the manager, and 10 minutes to discuss the future (expectations for the next get together).

In many organizations managers know very little about their team members. One-on-ones are a great opportunity for managers to establish a relationship with their team members and address issues and concerns on both sides on a frequent basis. You can use this opportunity to sense how engaged the employee is, how the work is progressing, and any wish list items or suggestions the employee may have. For the manager, it's an opportunity to offer suggestions, give feedback, and express short- and long-term expectations. Each meeting helps both sides track the progress in their projects, their training and long- and short-term goals.

When employees see that a manager is showing an interest in them, they feel more appreciated. Those who think they don't have the time to do this are wrong, as the time invested will increase the team's productivity and communication. There have been many individuals that have had this belief, but once they gave it a serious effort and saw the results, their beliefs changed. If you are looking for more than just a one-on-one review and would like a more global picture of how the employee is doing, consider adding an annual 360 review.

There is a ton of additional information online about one-on-ones; just Google "one on ones."

If you don't have a policy for reviews, create one, and if you have one—follow it! In my personal experience and in discussions with others in the AEC industry as well as many others, this one topic is a huge source of frustration for employees.

PRAISE

Although some people go on for years doing their job and are happy in their own knowledge or beliefs about how they are doing, most people like, and many need, to actually hear it. I am one of these. Although I strive to do the best I can and can beat myself pretty good when I make mistakes or don't meet my own high expectations, nothing feels as good as seeing that others recognize the efforts and results of what I have done. In this I am not alone. Celebrate and share in the victories, both big and small, be open and positive, but don't be generic. I have seen on multiple occasions where an owner or manager has thanked everyone in the office for the hard work they did on a successful project, knowing full well that there

Management

were a handful of people who actually made it happen or did the bulk of the work. Thanking everyone that plays a part is good, but making sure you take some extra time to recognize your stars is critical, particularly if you want to see the efforts continue.

Those who do not feel appreciated for the extra effort they put forth will likely find somewhere else to work where it *is* appreciated. Recognizing people for going above and beyond in front of their peers is not bad for the peers—it is good and shows that you recognize when extra effort is put forth, and you appreciate and encourage it. Positive recognition also serves to motivate others. Even if there are some “haters,” when they do something that garners them positive recognition, they too will bask in it. Keep in mind, while showing appreciation in front of peers is good, offering criticism is not.

Those bosses/managers who like to throw out the statement that “people should just be glad to have a job in this economy,” should know that’s the last thing anyone wants to hear. Unless employees are living under a rock, they know that they are fortunate and appreciate the fact that they have a job. But with all the layoffs and cutbacks, the employees who remain are typically there for a reason and maybe managers should be thankful that they still have good people that work long hours, often at reduced pay, to get out the work that keeps the company producing and in business in this tough economy.

REWARD

Although some folks may thrive on recognition or praise, many want to see more, such as a reward. Rewards do not always have to be monetary, but they should have real value. Bonuses are great, but raises are even better (raises feed you every week, not just once a year). For many, value can be expressed in a variety of ways. How about “employee of the month” parking, badges on a central board, printed certificates of appreciation, or lunch with the boss? All of these are low- or no-cost items that can provide some value to the employee, mainly in recognition.

Everyone likes money and if you plan to make a monetary reward, don’t forgo the low-cost options mentioned above—include them as well. I have never been a huge fan of yearly bonuses because they often do not align with the tasks or effort that is being rewarded. In sales-driven organizations, most salary-with-commission folks get bonuses paid out quarterly or monthly for their efforts, so why can’t the performance bonuses be treated the same? Cash flow and billing cycles are always a reality, so quarterly would seem like a good timeframe.

If cash is not available and you have no reserves, but you know money is coming, make sure you have recognized the top performers at the time of performance and let them know they will see something extra when bonuses do get paid out. After all, even you might forget what some of your folks did in January when March or, worst case, December comes around. Profit-sharing bonuses are typically done annually, but performance-based bonuses should be given at the time of or very near the performance that is being rewarded.

TRAINING AND DEVELOPMENT

Training benefits companies from all industries, but the more technical the work, the more critical and beneficial it becomes. Training is useful at all levels; the more knowledgeable a company is about its industry and products used, the more successful it will be with employee and customer retention. Keeping your managers up to speed on management skills and keeping your CADD techs up to speed on new software features not only makes them more productive, but it also keeps them feeling secure about their future.

If you cannot afford professional training, there are other options available to help team members improve themselves. Examples are in-house “lunch and learn” classes and inexpensive online seminars and training videos. Develop a mentorship program, where team members can improve their skills by working with veteran leaders.

When things go wrong, treat the failures as opportunities for improvement. Nobody likes to fail, but when given another chance, most will learn and improve. When an employee fails, he or she is typically at a low level of self confidence and is likely to be more open to feedback and coaching. This is an opportunity to try and get employees to open up to new ideas or ways of doing things. Keep a positive attitude and coach—don’t criticize. You can turn these failures into positive learning experiences.

EVOLVE

Regularly look back at the successes and failures you have had with your team. Take away from this your key successes and failures, processes and procedures, and make sure you keep doing the stuff that works and change the stuff that doesn’t. Keep looking forward—don’t get stagnant and “comfortable” with the old ways.

Remember that people are investments, not just acquisitions. To keep the good ones you will need to continue to invest in what you have. In almost all cases, it is far less costly to maintain than replace. Do these things and do them consistently; communicate, perform maintenance, recognize, review, reward, develop, and evolve. You will keep the returns coming in on your investment!



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

Autodesk 360 Mobile

Autodesk recently released the Autodesk 360° Mobile App for Apple's iOS and Google's Android-based smartphones and tablets. Autodesk 360 supersedes the Autodesk Design Review Mobile App, which was lacking a lot of basic functionality beyond just viewing DWGs and placing the odd markup. Even though this was the case, at the time it was most certainly a welcome addition to Autodesk's mobile apps offering. Design Review Mobile was a poor reflection of what its desktop-based parent was capable of, so it makes sense that its replacement comes in line with Autodesk's '360' brand. Whether or not this confusing brand should continue is up for debate.

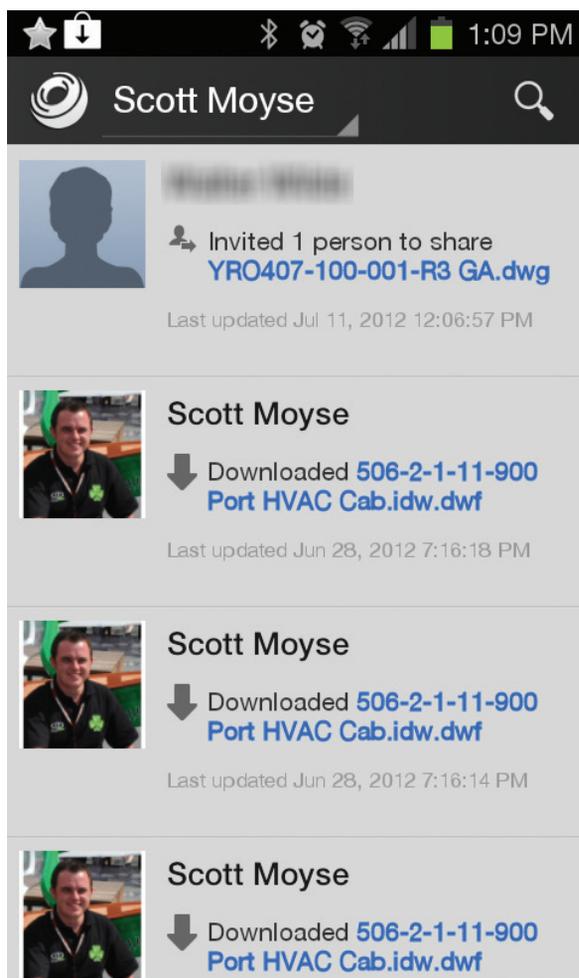


Figure 1: Recent site activity page.

I quite like what Autodesk 360 Mobile has to offer so I thought I would review some of its best features, but also some of its current drawbacks.

GETTING STARTED

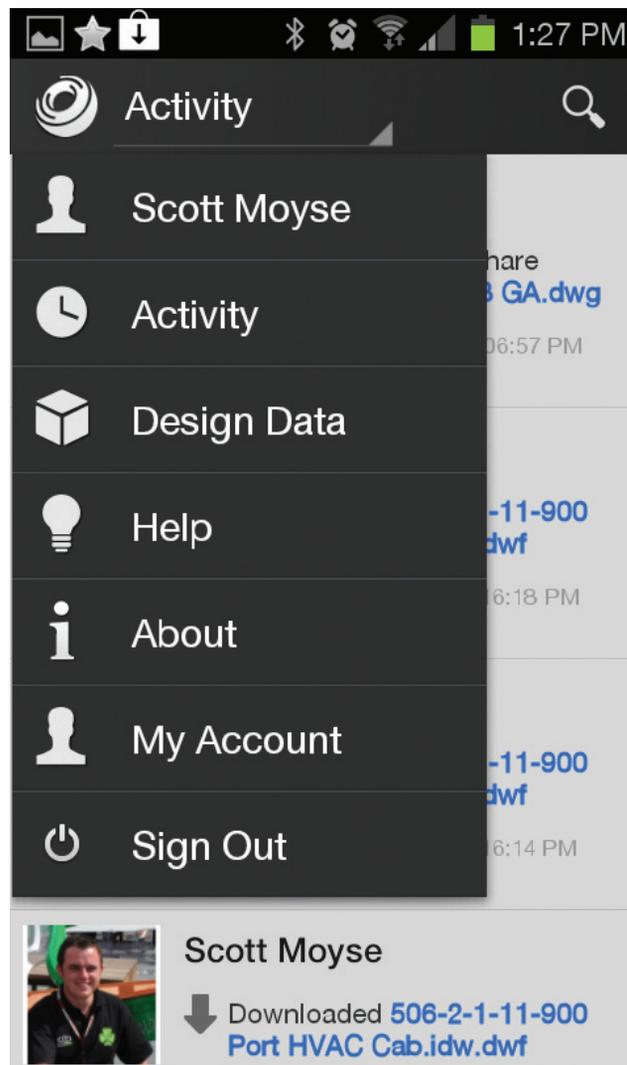


Figure 2: The main menu.

If you haven't done so already, crack on and create yourself an Autodesk 360 account by going to 360.autodesk.com. Then download 360 Mobile via Google Play or the Apple App store. Then upload a document to the Autodesk 360 website. Once you have signed into the mobile app you are presented with the Recent Activity page (see Figure 1).

Your first port of call is usually the main menu (Figure 2). It is here where I hit my first snag. I immediately started trying to select the top menu item, expecting it to take me to my profile information (Figure 3).

Autodesk 360

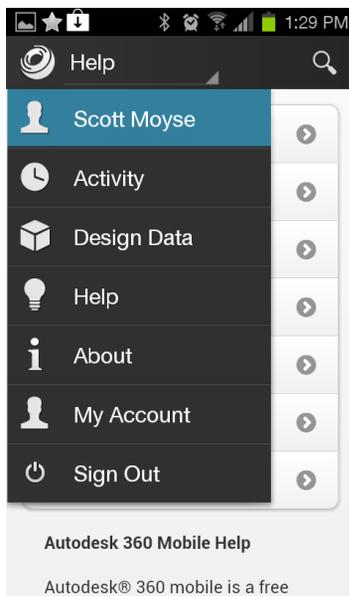


Figure 3: Misleading menu item.

The next menu item in the list is Activity, which was what you see when you first login. Let's skip that for now.

The second item is the business end of the App, but just to be boring, we'll take a look at the help section first. The help is well laid out for the features the app has at this stage. It's well categorized and easy to understand, with the following topics.

- + Quick Start
- + Tour
- + View Activities
- + View Documents
- + Share Documents
- + Add Comments
- + FAQ

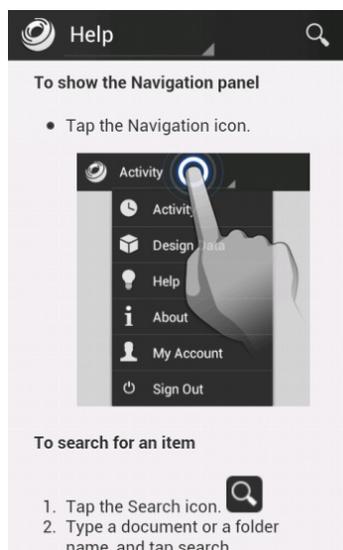


Figure 4: Make sure to take the tour!

The best place to start is the tour, which gives a great overview of Autodesk 360 Mobile's intentions and basic feature set.

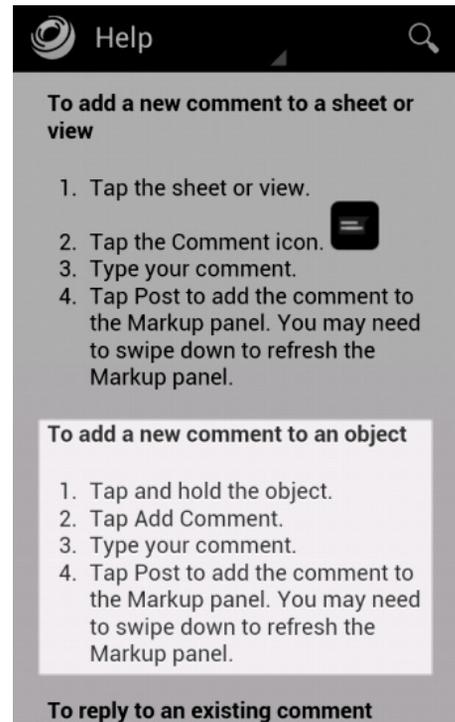


Figure 5: I'm not sure if I've successfully achieved this.

The only anomaly I found is the help file states you can attach a comment to an object (Figure 5); however, I haven't been able to differentiate between a comment attached to an object or just applied to the file itself.

DESIGN DATA

From the navigation menu select Design Data and you will be presented with a list of the files and folders you have stored on your Autodesk 360 site. You can store any files you want on the site, but only the following file formats appear to be supported by the app.

1. 2D DWF and 3D DWF
2. DWG

The Autodesk 360 website, from what I can tell, supports viewing of the following file types.

1. 2D and 3D DWF
2. DWG
3. JPG and PNG
4. BMP (supports a preview, but not a full view)
5. PDF

Although you can't view all the files that you can on the website, you can view thumbnails and summary details (Figure 6).

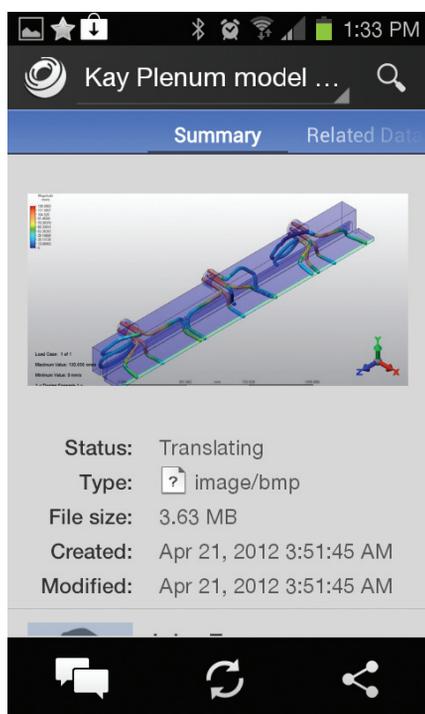


Figure 6: Image files aren't supported.

Once you select a supported file from the Design Data screen, you are presented with the Related Data screen instead of the drawing's first sheet of 3D model. If it's a drawing you will likely select "sheet," but then you have to select which sheet you want to view from the list (Figure 7). Realistically, the app should simply load the thing and allow you to navigate through the drawings sheets and views from there.

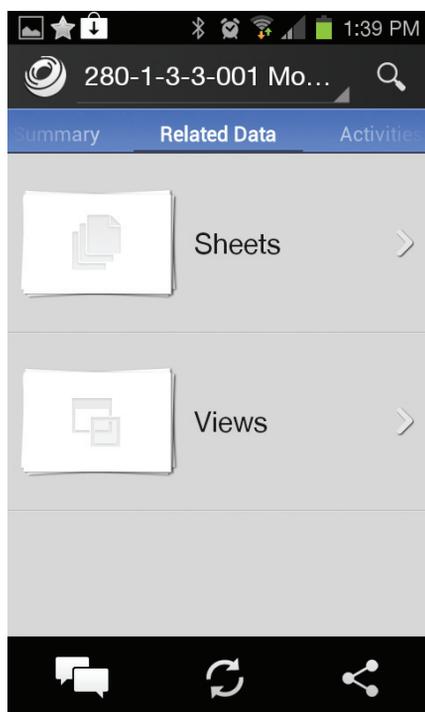


Figure 7: Select the sheet or view you want to display.

VIEWING

Once you have opened the drawing, navigating around it is extremely smooth, and switching to Landscape mode clears the screen of all toolbars.

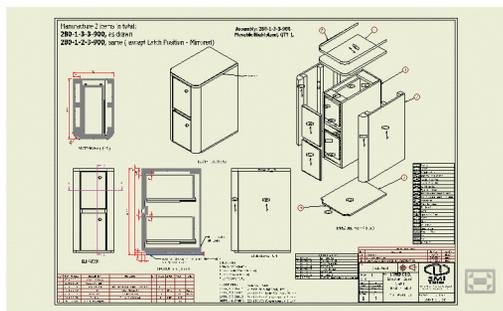


Figure 8: Landscape viewing.

The UI is beautifully clean in landscape mode, with loads of screen real estate, a factor I love and one that is lacking in other Autodesk Mobile apps. The only problem is it only supports viewing—you can't use any of the tools provided since there's no access to the toolbars until you return to portrait mode.



Figure 9: 3D DWF viewer and toolbars.

With any CAD file you have the following tools available on the lower toolbar (Figure 1).

- + Visibility
- + Saved views and Home view
- + Full screen
- + Comments
- + Sharing

The Visibility icon is disabled in the 3D view until an object has been selected. At that point it will display all the properties assigned to it from within the 3D CAD package used to model it.

Autodesk 360

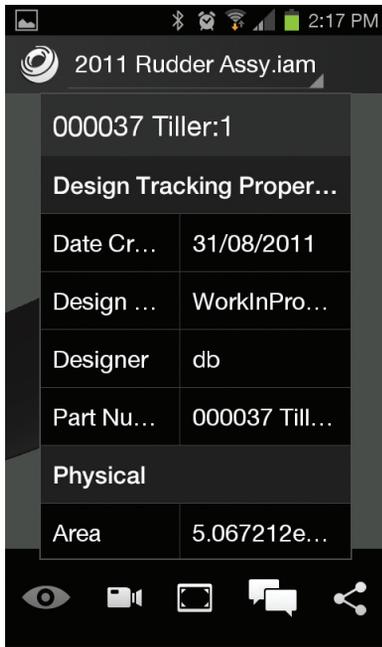


Figure 10: 3D model object properties.

Clearly, this feature would benefit greatly from being viewed on a tablet instead of the 4.3" screen of the Galaxy S2. Maybe something could be done to support smaller screen sizes for smartphones as opposed to tablets.

When the file being displayed is a 2D drawing, the 'eye' icon displays the layers available (Figure 11) so they can be turned on or off as needed.

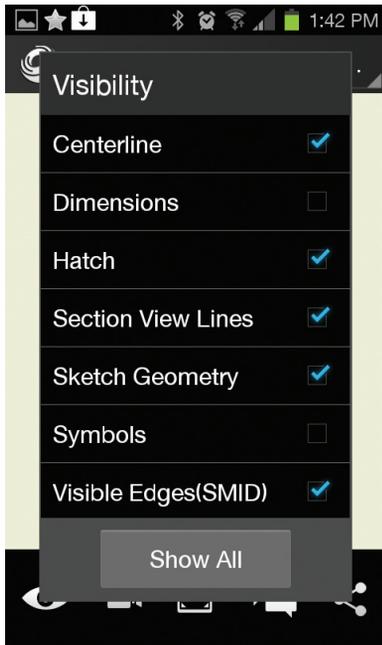


Figure 11: Controlling 2D drawing layer visibility.

I could not find a way to change from one drawing sheet to the next without going back to the previous page and selecting it. Maybe Autodesk could add a page navigation section to the 'eye/layer' icon menu.

COLLABORATION

The first release of Autodesk 360 Mobile has a nice Commenting feature. It's a similar style to the AutoCAD WS 'Design Feed,' which is actually a conversational or social way to collaborate on and review a drawing.



Figure 12: Conversations can appear as individual threads.

It is inferior to AutoCAD WS's implementation in the sense that you can't visually attach a comment and ultimately a conversation to a specific area of a drawing or object in a model. In addition, comments can't be tied to revision clouds or callouts of any form, which in truth is rather disappointing and inefficient. I would expect this sentiment to be the case with a large number of the users.

Hopefully some code sharing can happen here because the WS 'conversation'/Design Feed set up is slick.

With Autodesk 360 Mobile it's not openly obvious if the drawing/file has any comments associated with it, without actively looking to see if there are any.

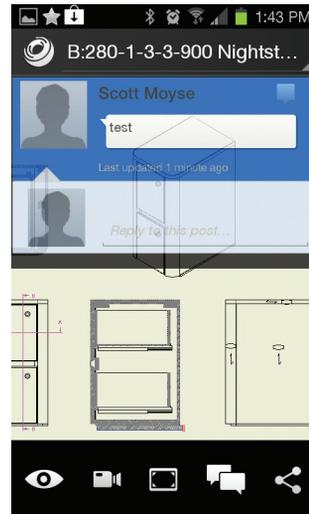


Figure 13: You can toggle the visibility of comments on and off.

Nevertheless, it is easy to just tap the comment icon and overlay any conversations which might have been started on the drawing. You are immediately presented with an opportunity to reply within that interface, which is a nice feature.



Figure 14: The Help file says you can attach a comment to an object.

I am really looking forward to this feature being made more obvious. I have tried a number of times to apply a comment to an object within the 3D viewer, but I haven't been able to tell whether I've succeeded. I should make it clear that I have been testing an early version of the App and it is quite possible this has been resolved by the time this article is published.

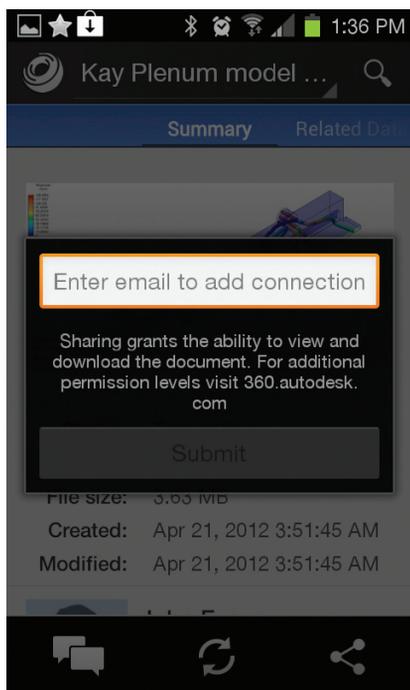
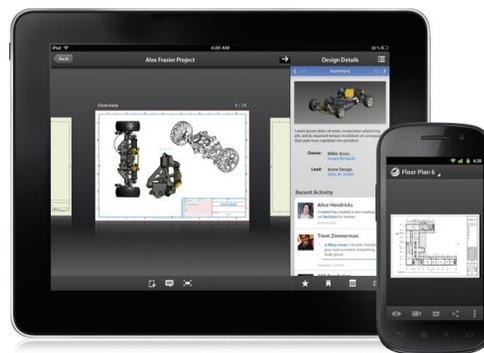


Figure 15: Sharing from the app is possible.

Sharing is enabled from within the app; however, it doesn't give you the option to share it publicly. Since it only asks for an email I assume it is a private share. This is quite likely the most common use for sharing design information anyway.

CONCLUSION

Autodesk 360® Mobile takes a fresh look at enabling mobile collaboration by integrating it directly with the cloud-based and browser-accessed Autodesk 360 document storage service. It's a refreshing and solid foundation to build a great app with exceptional features going forward into the future. They have some work to do, though. Better commenting tools and integration with the desktop app are essential. Without that, Vault users taking advantage of the ECO process or any user leveraging the desktop apps' review tools are being forced away from using it for anything other than viewing DWFs on the go.



I do wonder if Autodesk will link up its mobile apps so one app will use features of another, in a similar way to how the two ForceEffect apps work together. I would like to see Autodesk 360 Mobile open ForceEffect documents stored on Autodesk 360 within the ForceEffect app.

Although AutoCAD WS and Autodesk 360 Mobile offer completely different feature sets, they do have features that appear to be developed concurrently. I would like to see some parity between the two apps in the areas they can share. Unfortunately, at this stage neither of them provides a solid way of bringing mobile-based reviews back into a controlled, desktop-based review system. Maybe it's the desktop applications (Vault and Design Review) that need to change...



Scott Moyse is the Design Manager for SMI Group, a Super Yacht Interiors company in New Zealand. His background is in Motorsport Engineering and CNC programming. Scott has been using various Autodesk software for 9 years, most recently he has been implementing Vault Pro. He can be reached using Twitter @scottmoyse and scott_moyse1@hotmail.com



Myth Buster: Revit & IFC

BOLD STATEMENTS

Autodesk® Revit® is perfectly capable of exporting any kind of geometry to Industry Foundation Classes (IFC), without the loss of any geometry.

Revit is perfectly capable of importing and translating an IFC model to native Revit geometry.

With that, the entire Open BIM versus Closed BIM debate does not exist.

BACKGROUND

We have two major players in the BIM scene here: Revit and ArchiCAD. One of the major points of discussion for every firm has been the (supposed) lack of IFC compatibility with Revit.

I know that IFC does not (yet) play a major role in Autodesk's home country, the US. But in other parts of the world it does. Following other countries, the Dutch Governmental Building Agency

has issued the use of IFC as a deliverable for BIM projects in certain categories. Whilst the mandatory use of IFC is now limited to major Design and Build contracts, it is expected that this will evolve very fast. So this makes one wonder: where DOES Revit stand in all this?

If I listen to the OpenBIM consortium, Revit's handling of IFC has always been and will always be dramatic. Most often heard reason: "Autodesk seeks world dominance with the rvt format just like it established with the dwg format."

I'm not quite sure why this is a bad thing, though. Does this not always happen with a new (software) technology? Look at Office, PDF, Java, Photoshop, iOS, Facebook Likes, and so on. They all sought to dominate the world in their own market and succeeded pretty well at it. What's the problem? New companies emerge, they take the idea and make it better or cheaper. Or they come up with a brand new revolutionary concept that in its turn will seek world dominance. That's how innovation works in my book.

But it is also completely beside the point. Every commercial company in its right mind should seek world dominance. It's their reason for existence. And it does not mean that with that, IFC is not properly supported by Autodesk.

Likewise, I'm not sure whether or not IFC is "the future." I guess it depends on the way you want to use it. If used as our government wants—as a container for all geometry and the most important properties only—I think it already works decently.

If you want to transfer other stuff for use in complex calculations and analysis, in my humble opinion it will fail miserably. Why? Basically you can compare it with Google Translate. IFC has a similar growth path.

A few years back Revit would produce IFC files with horrible errors, weird translation mix-ups, and so on, just as Google Translate did.

As more development came, Google Translate got better. It now is pretty decent at translating basic languages, IF you use simple grammar and sentences. Not all languages work equally well (Dutch, for instance, seems to be pretty tricky), but at least you will understand the meaning of the translation and it will be right to the degree that the errors stand out and can be corrected. I think that current versions of all modeling software have come to that point.

But you will always know the difference between a native speaker and a programmatic translation based on a set of rules. There is no way either Google Translate or IFC is ever going to capture all the finesses of a complex language, whether it's human or computer code.

During a session with one of my clients, I got fed up with the ongoing debate about whether or not it is possible to do a decent export or import so I decided to spend a few days to look for myself. I asked for, and got, a few of the most annoying pitfalls of Revit's IFC handling.

1. Revit doesn't have IFC parameters
2. IFC Export: half the geometry is lost or gets tossed in the proxy (IFC's lost & found bin)
3. IFC Export: there's no way to overrule general settings
4. IFC Export: there's no way to export partial models
5. IFC Import: everything just gets tossed in the Generic Model category
6. IFC Import: there's no more parametric intelligence after an import

REVIT DOESN'T HAVE IFC PARAMETERS

This one had me stumped for a long time, too. Why is there no connection between Revit parameters and properties and IFC parameters? Turns out there is, at multiple levels.

First off, there's the hard-coded connection. Select a Wall. Basically every hard-coded parameter is an IFC parameter. Works wonderfully on export, just not on import.

Secondly, there is a shared parameter file created by Autodesk and published here: <http://tinyurl.com/c5r8ha2>. There is even a template file to use when working with IFC with all those parameters preloaded. So one *can* create Revit content with use of those IFC parameters.

I just don't get why the geniuses at Autodesk putting together the outb content didn't think it worth it to ship with Revit.

IFC EXPORT: HALF THE GEOMETRY IS LOST OR DUMPED IN PROXY

I created a simple model with some known problematic issues:

- + Wall sweeps and fascias
- + Slab edges
- + Existing buildings modeled as a mass

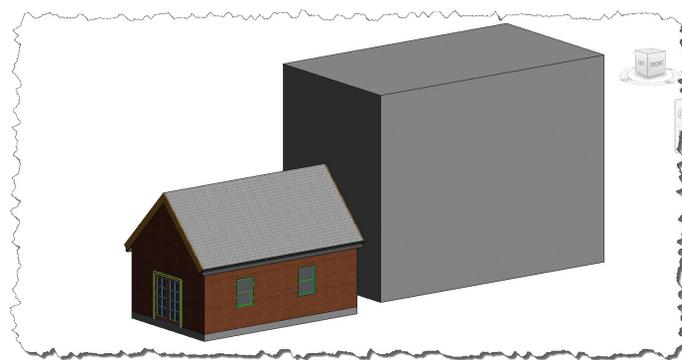


Figure 1

Exporting this to IFC (Revit > IFC > Export) using the Revit standard settings leaves us with Figure 2.

- + No mass
- + Sweeps, fascia, and slab edges are exported into the proxy
- + All materials are gone

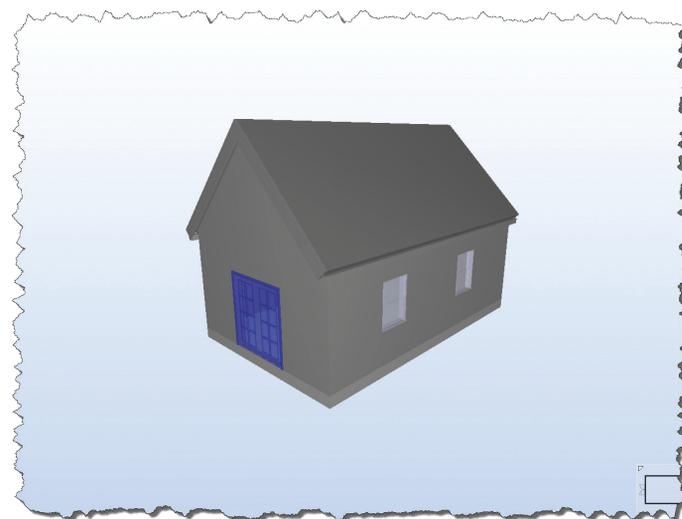


Figure 2

Revit Architecture 2013

How is this handled within Revit?

In the Export options (Revit > Export > Export Options > IFC Options) there's a map defined to export different categories from Revit to IFC. In Figure 3, it shows the standard export option for Mass set to "Not Exported." No wonder the mass isn't present in the IFC file. Luckily, Revit lets us define our own mapping and save it as a separate file. All you need to do is go carefully through all your categories and map them to a specific IFC category.

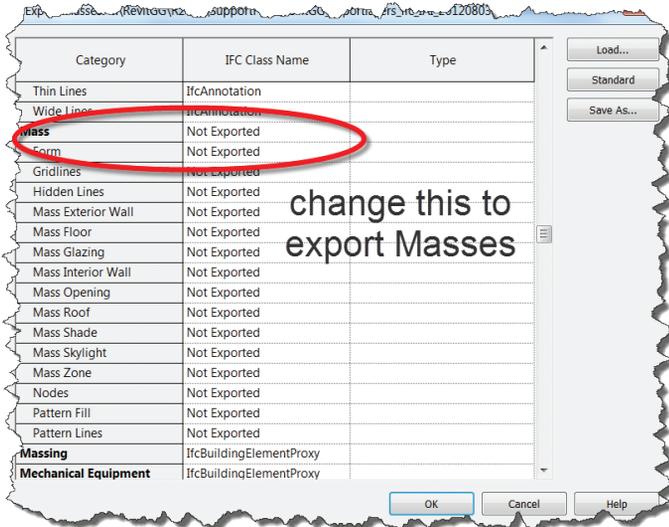


Figure 3

For those of us who need to find out which categories you can use, there's a complete list at the Revit Wikihelp page (<http://tinyurl.com/d95g9gd>).

IFC EXPORT: THERE'S NO WAY TO OVERRULE GENERAL SETTINGS

Partly right. A Revit wall will always be an ifcWall. There's no way to overrule that, and why should you? If it's a wall, it should be modeled as a wall, and it should be exported as a wall. Period.

However, there is a way to override an elements export class by setting two shared parameters from the Autodesk IFC Shared Parameter file:

IfcExportAs > Specify the desired IFC class override. You can even use the DontExport entity name in the IFC class table to prevent a certain element from exporting to IFC.

IfcExportType > Specify the desired IFC type override.

There are a few pitfalls, though.

- This only works on component or in-place families, not on system families. This is both good (why would one want to export a wall as anything but a wall?) and bad (for instance, a Wall Sweep can be a lot of different things).
- This only works on family types, not instances.
- You need to add the Shared Parameters to the families themselves. Simply adding them to the project isn't enough. Open the family, add the shared parameters, and reload. You can set them to the desired value in the project.

IFC IMPORT: EVERYTHING JUST GETS TOSSED INTO THE GENERIC MODEL CATEGORY

I can be short about this one. Just as with exporting an IFC, there is a map. What IFC category goes where: it is true that the standard import map basically puts everything in the Generic Model category, except for walls, floors, roofs, ceilings, doors, and windows. But just as with the export map, you can adjust this to your own needs.

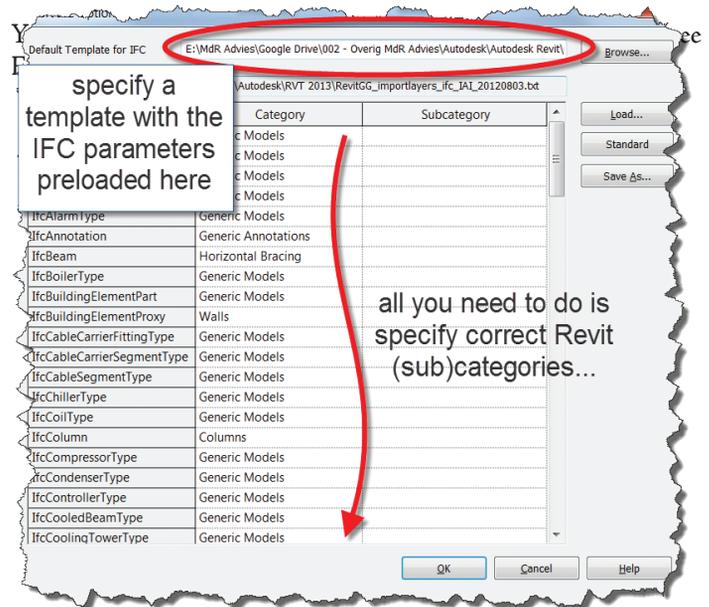


Figure 4

IFC IMPORT: THERE'S NO MORE PARAMETRIC INTELLIGENCE AFTER AN IMPORT

Well, no, there isn't. And frankly, I think there shouldn't be because IFC is not meant to work that way. When you transfer models with IFC, you're getting somebody else's model, somebody else's work. You don't need to adjust any parameters. If you want to do that, don't work with IFC. Work with the same software.

Having said that, I do think that conversion on import could be better. Parameter values for hard-coded parameters such as height and width should be added from the IFC import. After all, the dimensions are known in the IFC file (Figure 5) but aren't transferred to the corresponding parameters in Revit (Figure 6). I can understand that parameters aren't tied to geometry anymore, but now it's not even possible to schedule overall dimensions.

to replace all non-system families if you want to actually do something with the import.

Exporting is a different story. Overall, exporting IFCs can be pretty much customized to your needs and works rather well. Here, too, there are glitches. One needs to be very careful with defining project coordinates, for instance. Elements can magically relocate themselves on a completely random basis. Also, IFC doesn't work well with certain features such as attached walls and edited profiles.

But these are issues you come across on other platforms, too, even the ones "specialized" in IFC and OpenBIM. So I'm guessing that's an IFC problem, not Revit-related. In fact, I asked representatives from a few of the major leading Dutch architectural firms for their honest opinions of ArchiCAD and IFC. Would they submit IFC models as part of the deliverable documents to their clients without very thoroughly checking them? For all companies, the answer was an overwhelming, "Are you insane? Of course not! Only native documents get submitted."

I'm guessing that's my major point of pain when it comes to IFC in a BIM workflow. There's no guarantee (yet) that it's 100 percent, no matter which modeling software one uses. But it's here, it's reality, it's mandatory (sometimes), and from where I'm standing, Revit does a pretty decent job of exporting them.

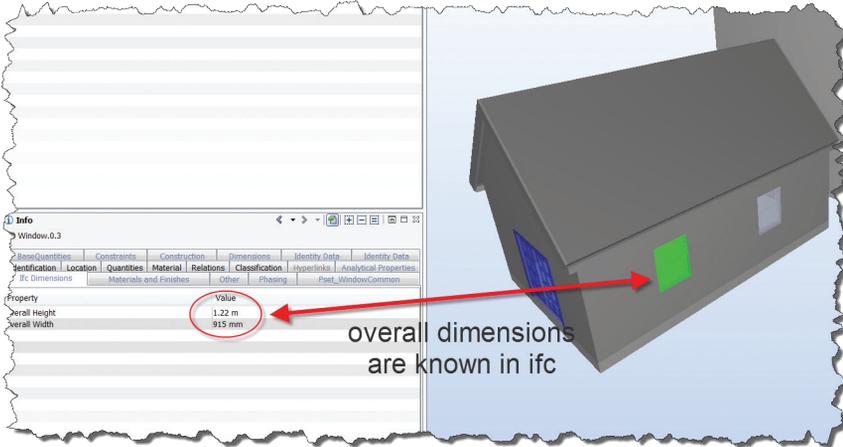


Figure 5

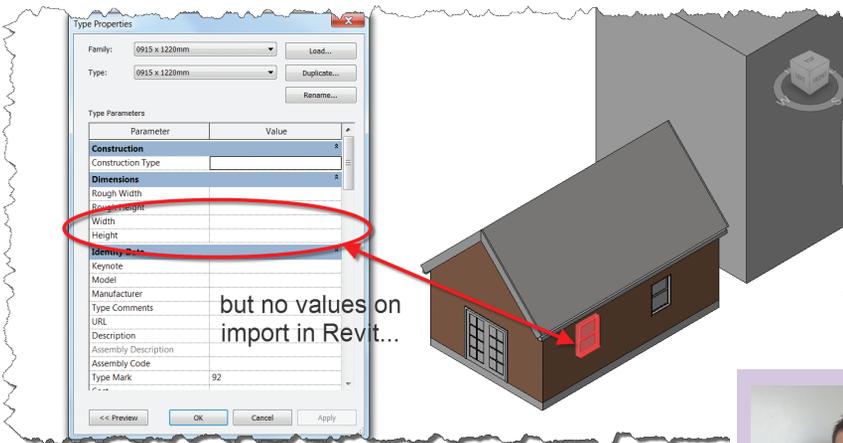


Figure 6

CONCLUSION

So are Revit and IFC a match made in heaven? Heck no! There's still much to desire. A lot of stuff just doesn't work, especially when it comes to importing IFC models. Basically, Revit lets you import an IFC model and use it as a linked file. Other than that, it's pretty much useless. More parameter values should be mapped, such as the overall dimensions shown in this article, especially if you realize that it can be done: select a non-structural wall, set it to structural, export to IFC. After this, open the IFC in Revit and you will find that the Revit parameter for structural usage is still perfectly matched.

Importing gets slightly better when you use a file with the IFC parameters preloaded as a template, especially when it comes to working with software other than Revit. But still, it's necessary



Martijn de Riet is a self-employed BIM Consultant from the Netherlands, working with Revit since version 5.1. Martijn has a bachelor degree in Building Science. After his study he started his own engineering firm working for contractors, architects and private clients. Starting 2007 his company transformed into a full-time BIM consultancy service. At the moment, Martijn's clients vary from mid-sized architectural firms to the largest Dutch general contractor and MEP engineering firms, with a focus on specific corporate solutions, design, and implementations of Revit and BIM workflows. Martijn is a member of the Dutch Revit User Group and currently working on creating a Master Template and library. He provides lectures for companies, technical universities, seminars and such on a regular basis.

Schedule Tables in ACA



Schedule tables have evolved through many versions of AutoCAD® Architecture software. Schedule tables are created to graphically represent information specific to objects in your drawing. For example, you may want a schedule table for objects such as doors and windows. You may even want a schedule table for room finishes and space inventory. There are many possibilities for the use of schedule tables.

OVERVIEW

Before delving into schedule tables, it is important to understand some of the terminology associated with them. Here's a little overview of some important terms that apply to creating and managing schedule tables.

- ♦ **Schedule Tags** – You can use project-based or standard schedule tags in your drawings to graphically display the property data of an object. By linking the schedule tag to a property in a property set, you report property data of the object. When you anchor the tag to an object to which the property set is applied, the value of the property displays in the tag. The information in the tag is updated if the object or the property changes.
- ♦ **Schedule Tools** – AutoCAD Architecture provides default tools for project-based and standard wall, door, and window schedules on the Scheduling tool palette and in the Content Browser. Selecting one of these tools that has a style and other properties predefined allows you to quickly place a schedule table in your drawing.

- ♦ **Schedule Styles** – A schedule table style specifies the properties that can be included in a table for a particular object type. The style also controls the table formatting, such as text height and spacing, columns, and headers. Display properties in the style control the visibility, layer, color, linetype, and linetype scale of table components.
- ♦ **Property Sets** – A property set is a user-definable group of related object properties. When you attach a property set to an object or a style, the property set becomes the container for the property data associated with the object. Property sets are specified using property set definitions.
- ♦ **Property Set Definitions** – A property set definition is a documentation object that specifies the characteristics of a group of properties that can be tracked with an object or style. Each property has a name, description, data type, data format, and default value.
- ♦ **Property Data Formats** – A property data format is specified for each property definition within a property set definition to control how the data for that property displays in a schedule table, in a schedule tag or on the property palette. Property set definitions and schedule table styles use property data formats to control the display format of values for each property.

CREATING SCHEDULE TABLE STYLES

Schedule table styles are used to control the appearance and the content of schedule tables. A schedule table style for the type of schedule table you want to create must be contained in the drawing. When a schedule table style is copied into a drawing, data formats and property set definitions specified in the style are also copied. Property data formats and property set definitions will be discussed shortly.

Like many entities of ACA, schedule table styles are created and edited in the Style Manager under the Manage tab of the ribbon. To create a new style, expand Documentation Objects, right-click on Schedule Table Styles, and click new. Enter a name for the new style and hit enter.

Next, you will edit the options for the schedule table style. The eight tabs you can choose from are as follows.

1. **General** is where you would add a description, if desired. You can also click on Notes and add a note and/or a reference document.
2. **Default Format** allows you to specify the format you want for your new schedule table style. This includes text appearance, matrix symbol, and cell size.

3. **Applies To** allows you to specify which objects you want the schedule table style to track. This could be as simple as a polyline or a door. This could also be several ACA objects, depending on what information you wish to include in your schedule table.
4. **Columns** allow you to add columns to represent properties that are reported in the schedule table style. You can also add column headings, edit column data, and edit column placement in your style (see Figure 1).
5. **Sorting/Grouping** allows you to specify the sort order of each row within the schedule table style. You can also group columns together with this feature and specify if you would like to display subtotals for the group. The Grouping feature is new in AutoCAD Architecture 2013.
6. **Layout** allows you to specify the format of the table title, the column headings, and the matrix column headings.
7. **Classifications** allows you to assign a group of named properties to various objects. They assist in controlling how objects are displayed and scheduled.
8. **Display Properties** allows you to specify the visibility, line type, layer, and other display properties of the schedule table style you are creating.

Once your style has been created, you can drag and drop it onto your tool palette for quick access. You can also add the schedule table to the Annotation tab of the ribbon by using the CUI. I highly recommend doing this if you plan to use your new schedule table style frequently.

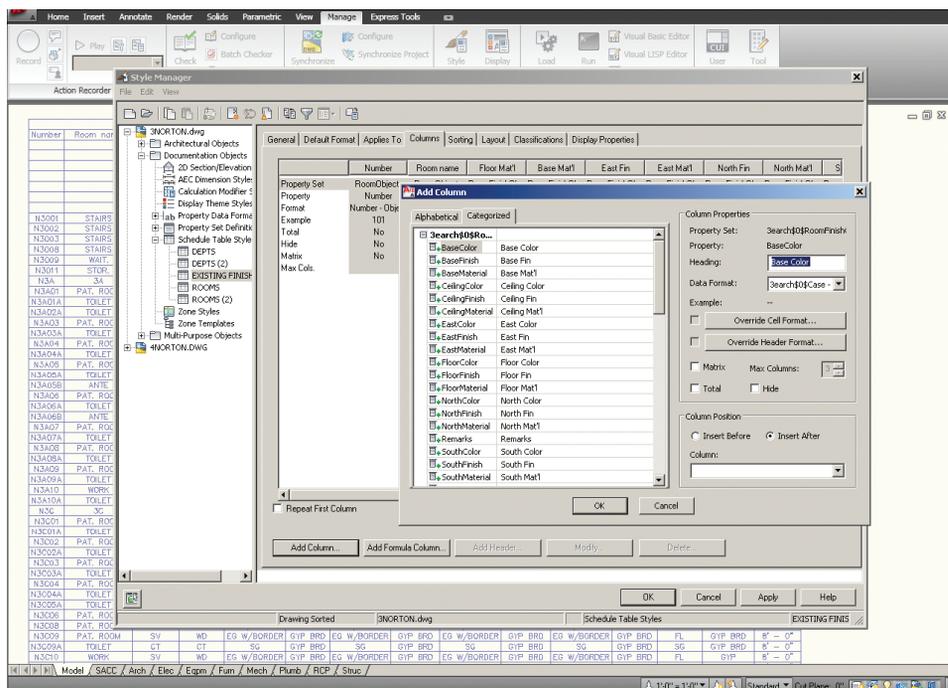


Figure 1: Schedule table style – Add Column.

AutoCAD Architecture 2013

PROPERTY DATA FORMATS AND PROPERTY SET DEFINITIONS

Before you create a schedule table, you will need to attach the property sets that are referenced in the schedule table style to the objects and object styles. These attached property sets become the containers for the data that will appear in your schedule table. A schedule table extracts the data from objects and displays it in the table. Data is not saved in the table itself.

Property set definitions are created and edited in the Style Manager under the Manage tab of the ribbon. To create a new property set definition, expand Documentation Objects, right-click Property Set Definitions, and click new. Enter a name for the new definition and click enter. As with the Schedule Table Style, you will want to check the entities to which your new Definition applies. Now you will want to click on the Definition tab and add Property definitions as needed (see Figure 2). Click Apply and OK when you are finished. Property Set Definitions are added to objects through the properties palette, extended data tab.

A property data format is applied to each definition within a property set definition. Property data formats are created and edited in the Style Manager under the Manage tab of the ribbon. To create a new property data format, expand Documentation Objects, right-click Property Data Formats and click new. Enter a name for the new format and click enter. Now, you will want to click on the Formatting tab. Here, you will need to specify how you wish for the formatting to appear. Fill in all information pertinent to the format you are creating. Click Apply and OK when you are finished.

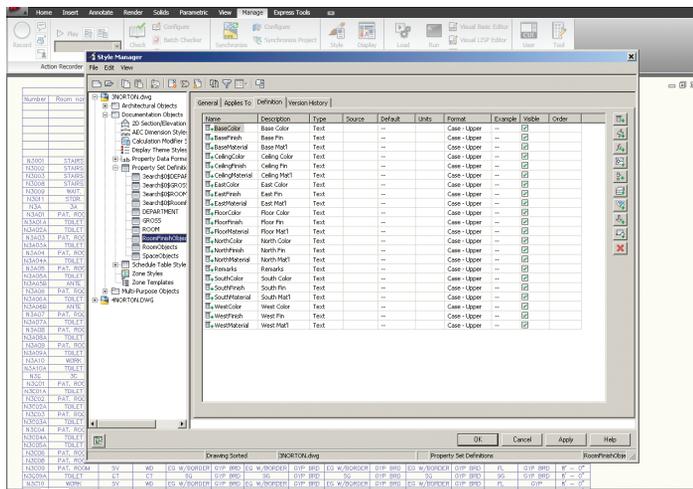


Figure 2: Define a property data format.

INSERT A SCHEDULE TABLE

Begin by opening the Annotation tab of the ribbon or opening your tool palette (depending on where you placed your new schedule table style) and selecting the Schedule Table you created. Next, select the objects you wish to include in the schedule table or you

can press enter to schedule an external drawing. Objects selected that are not of the type specified for the schedule table will automatically be filtered out of the drawing. Next, you will need to specify in the drawing area the insertion point for the upper-left corner of the schedule table and then specify the lower-right corner of the table, or you can press enter to scale the schedule table to the current drawing scale. (See Figure 3).

If your schedule table contains question marks in any of the cells, the property set definition that contains that property is not attached to an object or object style. If you have empty cells or dashes within cells, this indicates that the property set definition is attached, but data is either not available or is not entered for that object or object style.

It is important to note that property data formats, property set definitions, and schedule table styles cannot be changed through RefEdit. Changes made through RefEdit seem to work, but the drawing will revert to the previous settings when saved back to the xref file. If you are using an xref file and need changes to be made to the schedule table, you will need to open the xref drawing directly and make changes there.

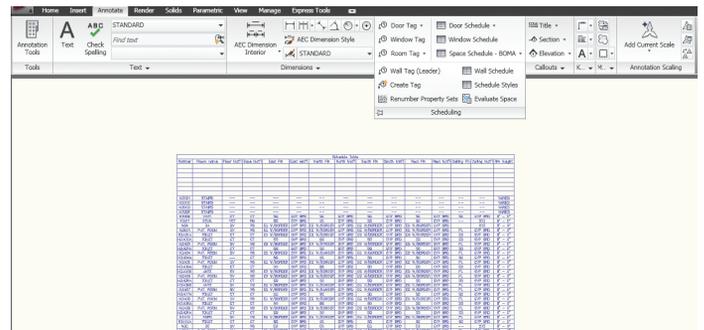


Figure 3: Annotation tab.

UPDATING A SCHEDULE TABLE

A schedule table will update changes automatically when the automatic update option is turned on. This option can be turned on by right-clicking on the schedule table style on the tools palette, and selecting properties. Under Selection you can choose to Add New Objects Automatically. If, however, the option is turned off, you can manually update a schedule table. To do this, select the schedule table, right-click, and click Update Schedule Table. Please note that when you select a schedule table in your drawing, the Schedule Table Tab appears in the ribbon. Updates and edits can be performed straight from the ribbon! (Figure 4)

You can also add objects to or remove objects from a schedule table after it has been inserted in the drawing. All you have to do is select the schedule table, right-click, and click Selection. Next, click either Add or Remove, depending on which you want to do. You then select the objects in the drawing that you want to add to or remove from the table and press enter.

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11th Annual AUGI Salary Survey

Thank you to the 2,778 members who took a couple of minutes out of their day to contribute to this favorite AUGI resource. Please keep an eye on *AUGI HotNews*, email blasts, and our social media channels next summer so you can participate, too!

Once again, your fellow AUGI members bring you a peek into work lives all over the world! Welcome to the 11th Annual run of your survey.

I hope you enjoy the new take on the Salary Survey. Please, feel free to suggest additional changes, after reading the FAQ on www.augi.com/surveys. This report should focus on what you want and need to know about what is going on in our industries right now.

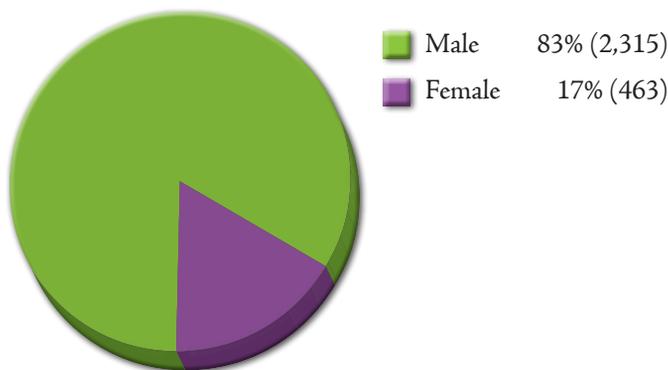
In addition to reviews of other industry surveys, many members provided input for the new questions and options, but, I would like to extend special thanks to Brian Myers and Frank Mayfield for their invaluable insight.

Take a peek at the average pay by various factors, and average them out for a good idea of what you could expect to make. Job seekers, take a look at the way that most respondents found their current roles. Management and Owners, take a look at the reasons why your top talent may be considering leaving your company.

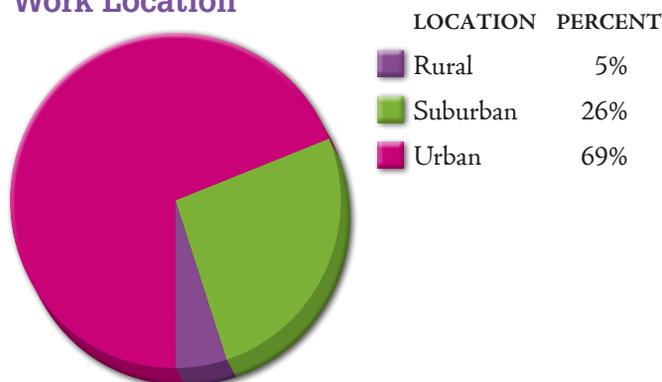
When asking for a raise, do not forget to gather as much support as possible. Check out Robert Green's annual CAD Manager's Survey, Indeed.com/Salary, the NACE Salary Calculator and any surveys specific to your specialties and industry.

See our podcasts for more tips on knowing, and demonstrating, your worth: <http://www.augi.com/publications/audio-video-content/>

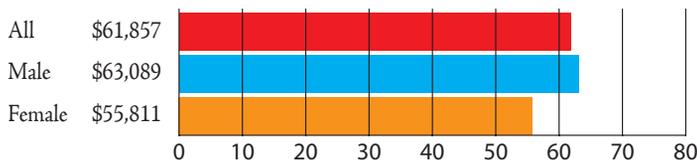
Employee Gender



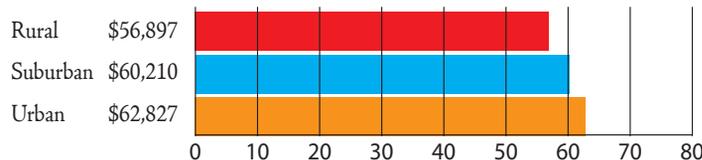
Work Location



Average Pay Per Gender

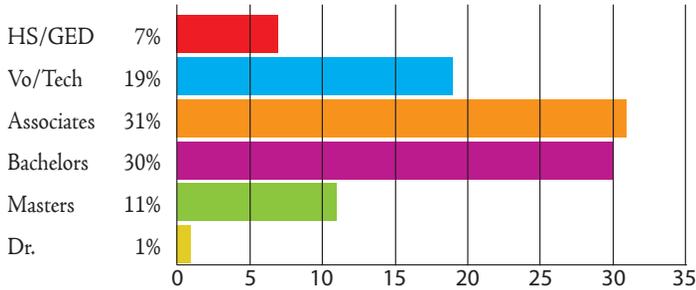


Average Pay By Work Location

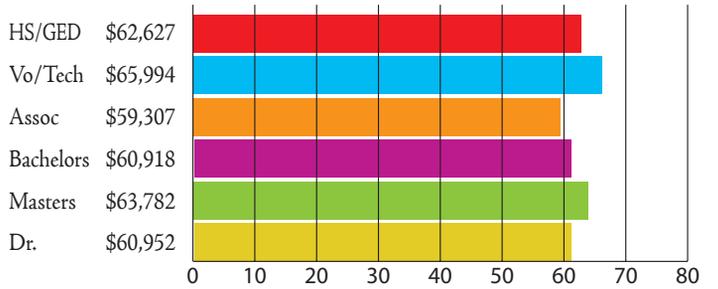


THE BASICS

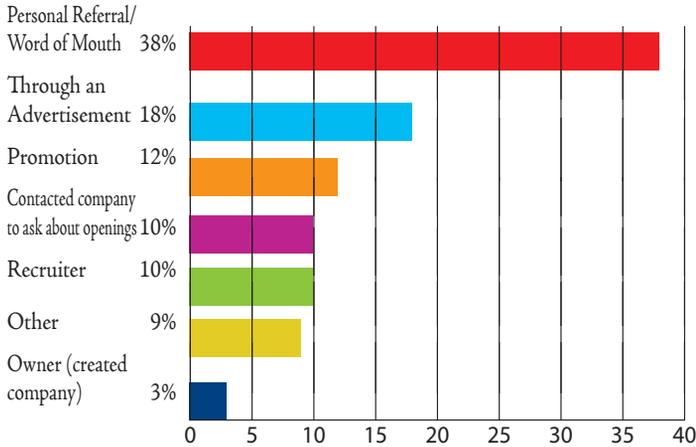
Education Level/Degree Attained



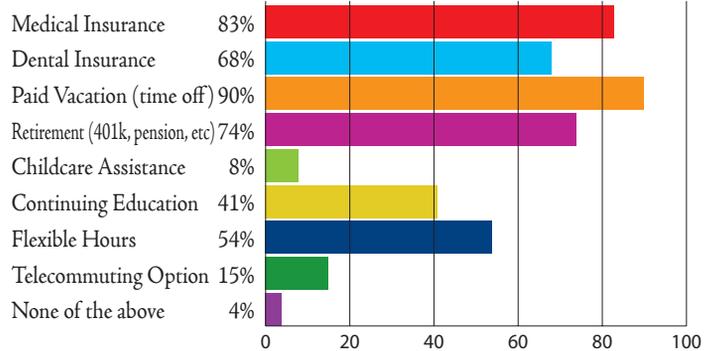
Average Pay By Education Level



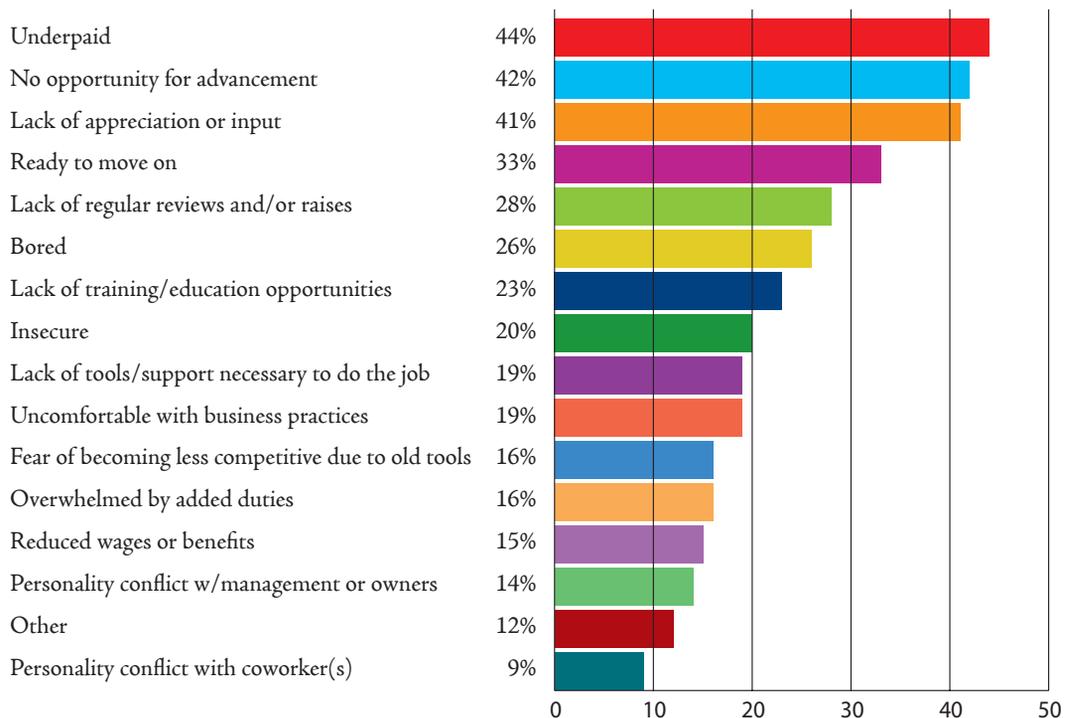
How Did You Find Your Current Role?



What Employee Benefits Are Available to You?



If You are Thinking about Quitting Your Job, What Factors Played a Role in Your Decision?



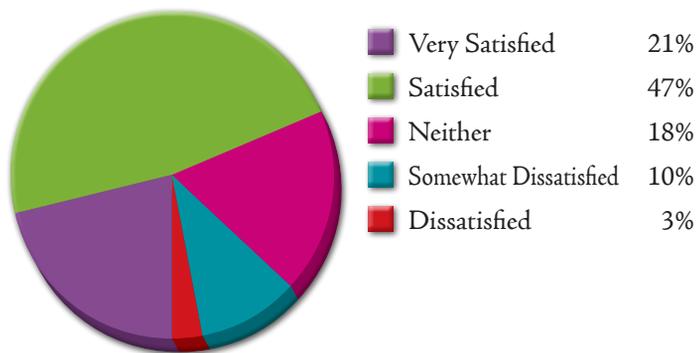
FAST STATS

Feelings of job satisfaction and security continue to dip downward, as they have every year since 2008.

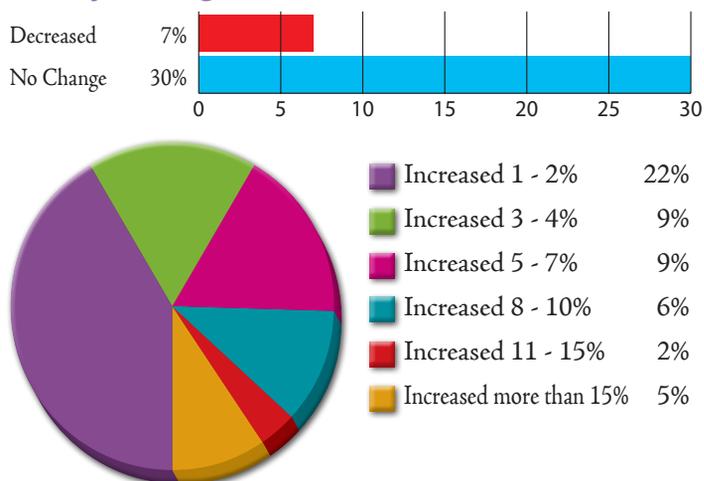
The average raise in 2011 was 5%, in 2012, the average rose to 6%.

More members are dealing with an increased workload in the same job.

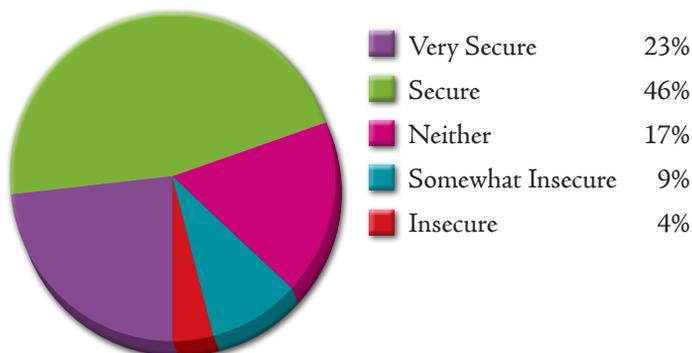
Feelings of Job Satisfaction



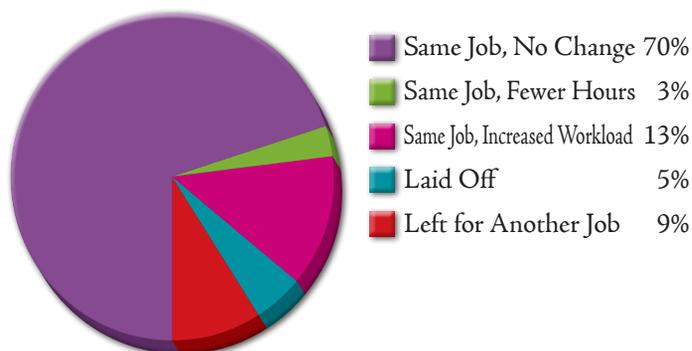
Salary Change This Year



Feelings of Job Security

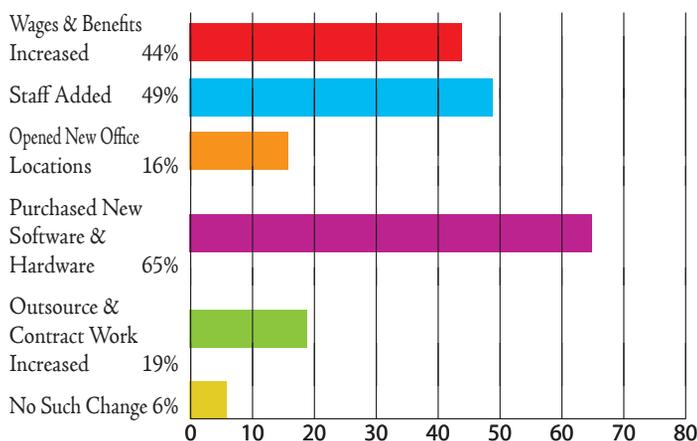


Change in Employment

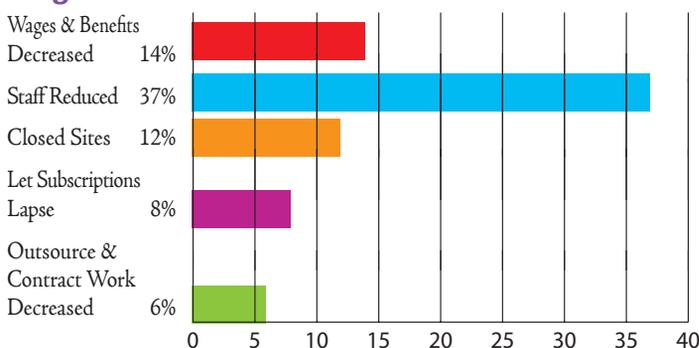


HAS YOUR COMPANY DONE ANY OF THE FOLLOWING IN THE PAST 12 MONTHS?

Positive

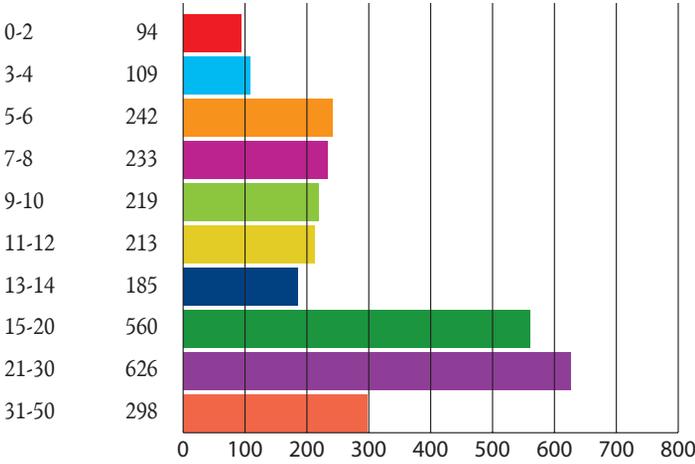


Negative

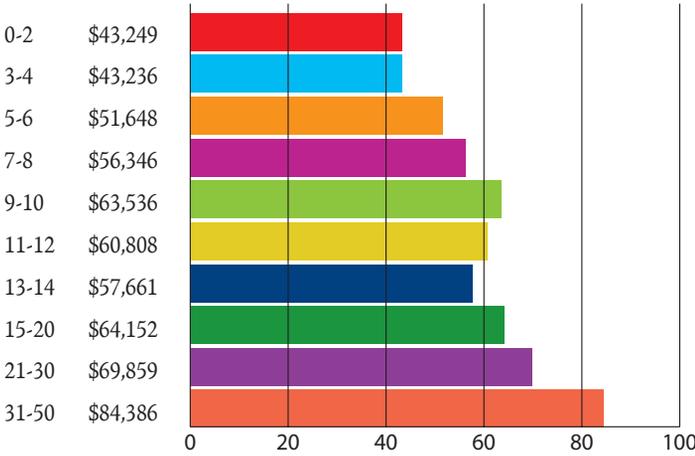


AUGI 2012 Salary Survey

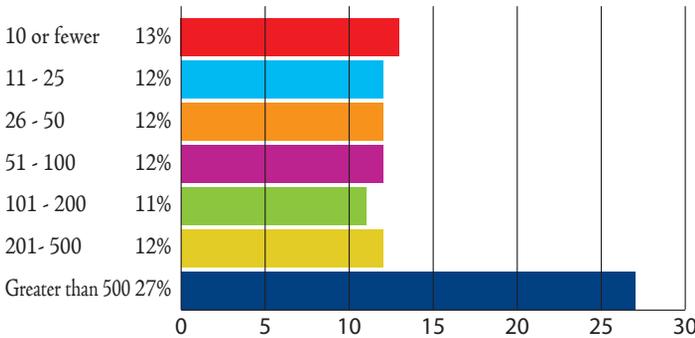
Respondents' Years of Experience



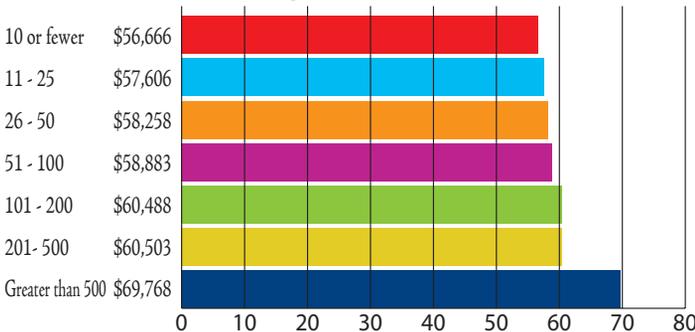
Average Pay By Years of Experience



Number of Employees in Company



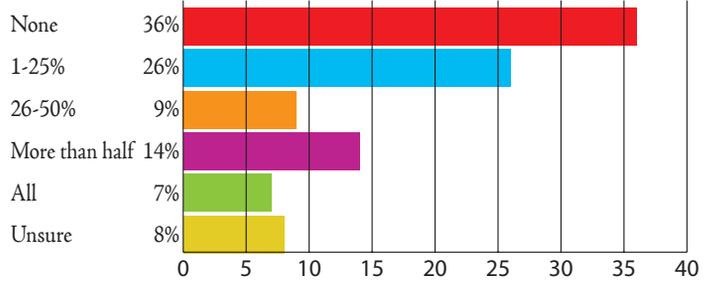
Average Pay by Company Size (Number of Employees)



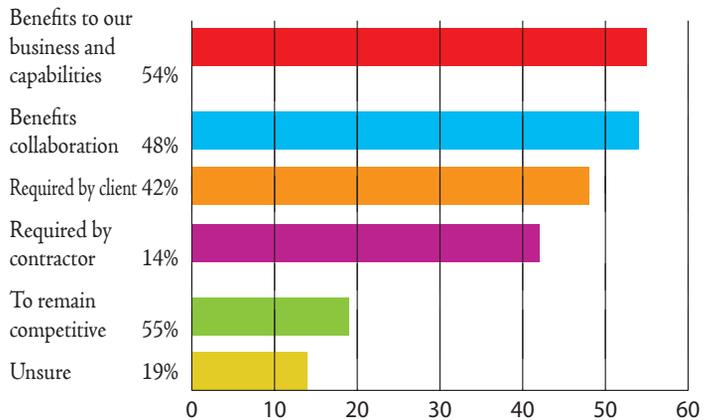
HOT TOPICS

Let's put some numbers behind all the buzz about BIM adoption and The Cloud...

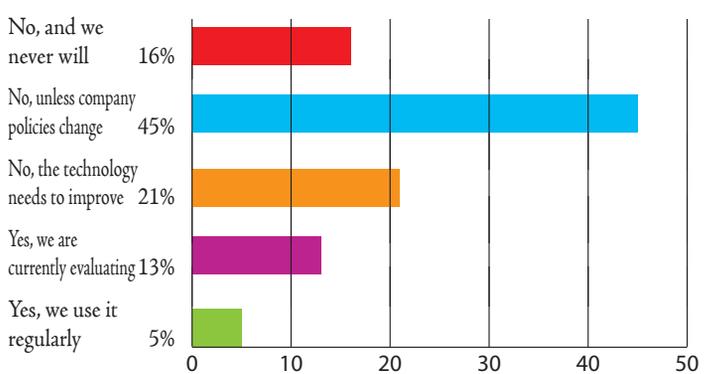
(If applicable) What Percentage of Your Company's Projects are BIM?



If You Are Using BIM, Why?



Do You Run CAD/BIM in the Cloud?

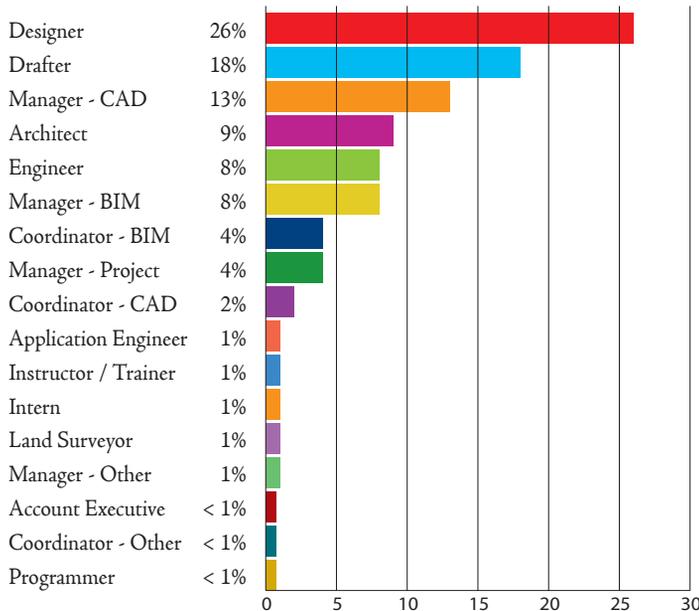


The average pay for those in firms who report doing no BIM projects is \$60,156.

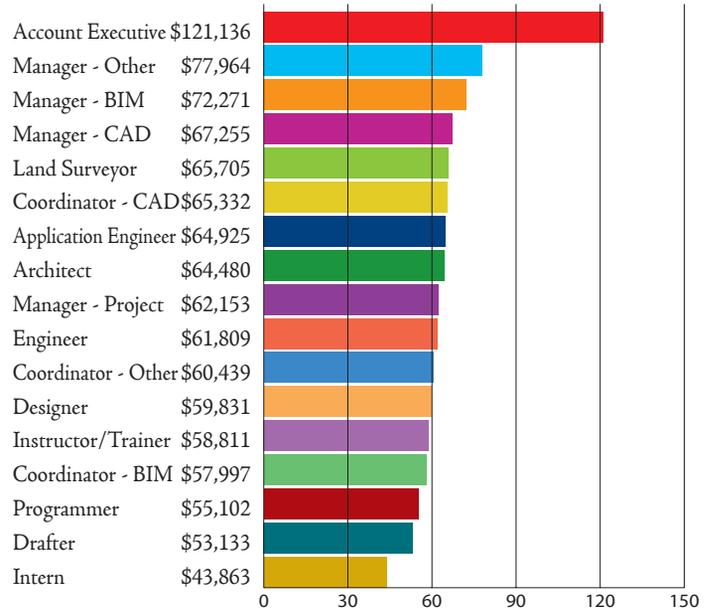
The average pay for those who report using BIM on more than half of their projects is \$64,310.

JOB TITLES

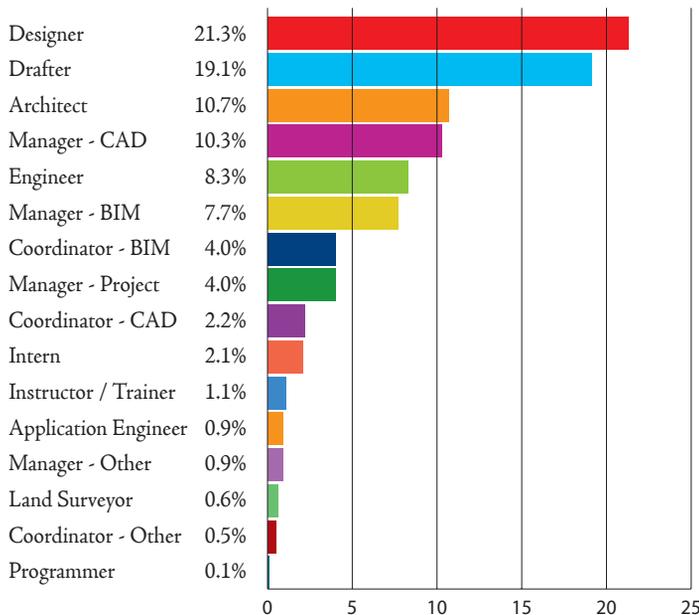
Survey Participants



Average Pay by Job Title/Function

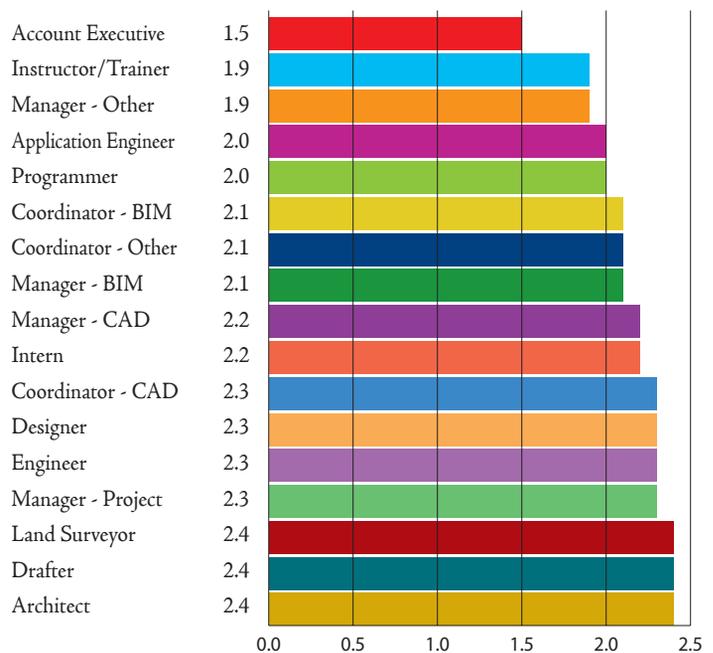


Those who reported considering leaving their current role because of being under-paid, percentage by job title:



Job Titles, listed in order from Most Secure and Most Satisfied to least.

(Average responses to levels of job satisfaction and perceptions of job security were closely matched.)



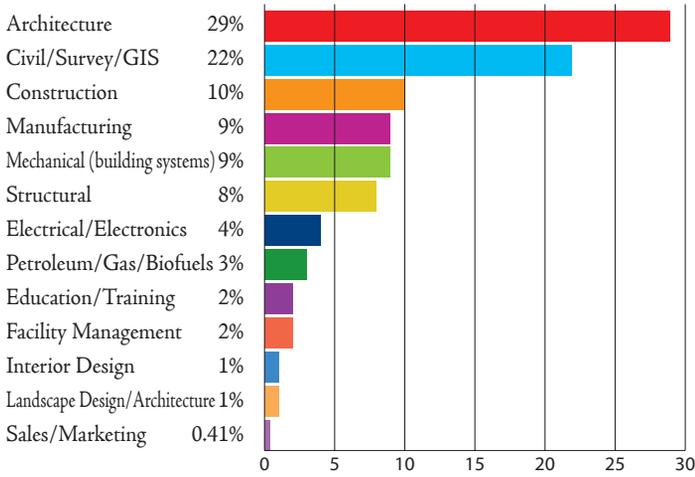
In 2007, less than 2% of survey respondents were titled as BIM Managers.

In 2012, this segment has risen to 8%, plus the 4% who are BIM Coordinators.

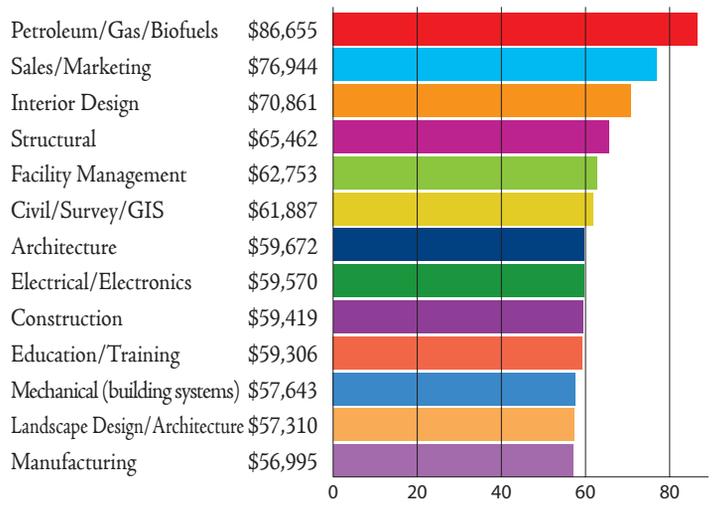
AUGI 2012 Salary Survey

INDUSTRIES / DISCIPLINES

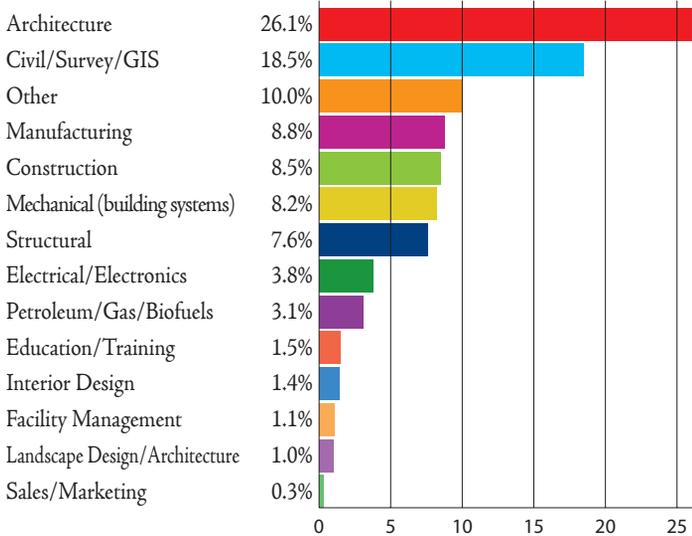
Survey Participants



Average Pay by Field/Industry

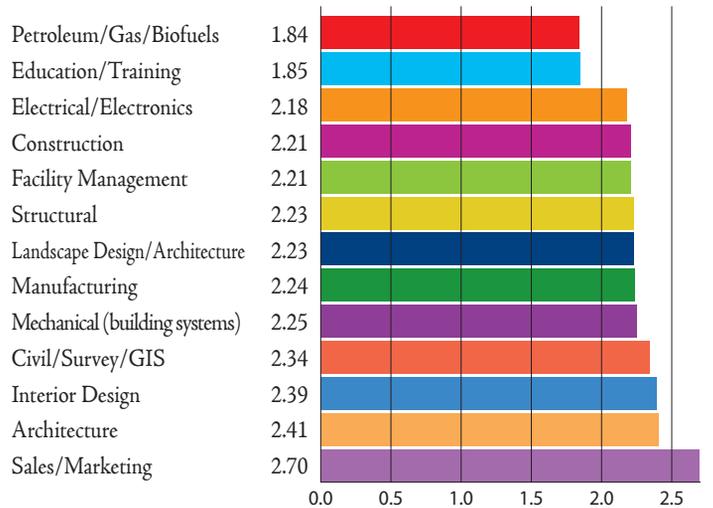


Those who reported an increase in staff in 2012, percentage by industry:

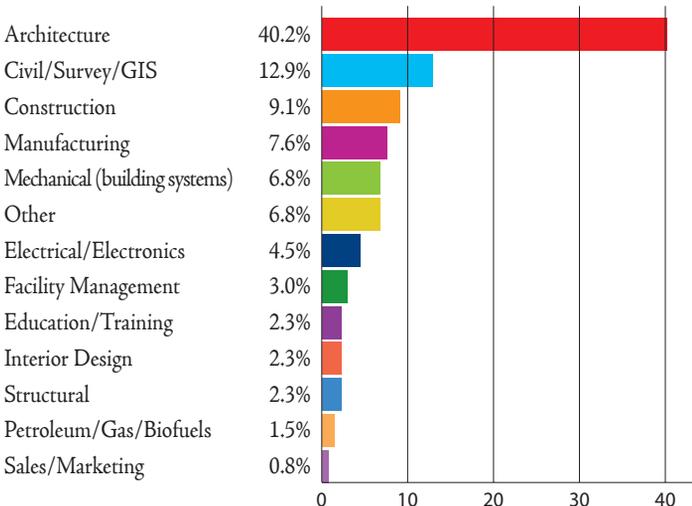


Industries, listed in order from Most Secure and Most Satisfied to least.

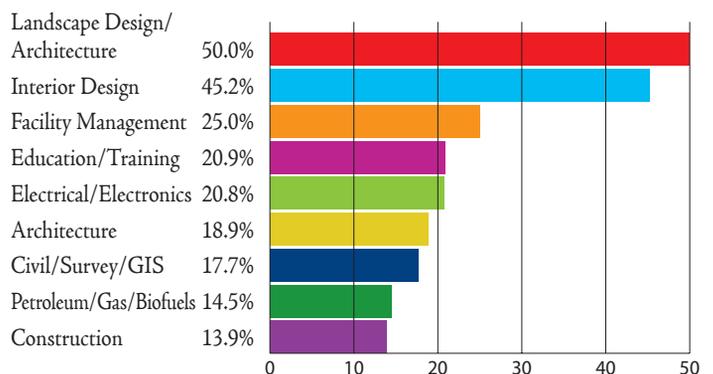
(Average responses to levels of job satisfaction and perceptions of job security were closely matched.)



Those who reported being laid off, percentage by industry:

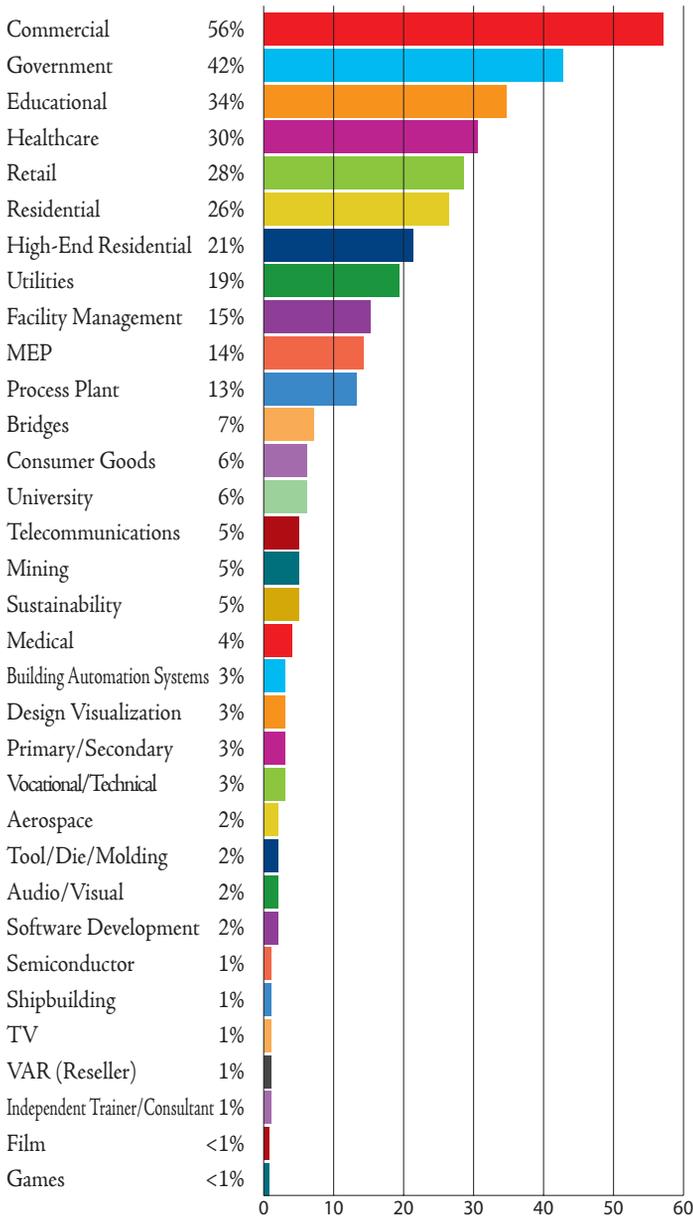


Top Fields for Women (percentage of female response by industry)



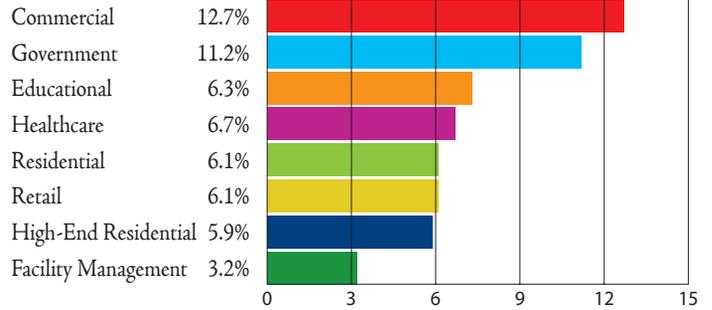
MARKET SERVED / SPECIALTY SERVICES

Percentage of Responses by Market

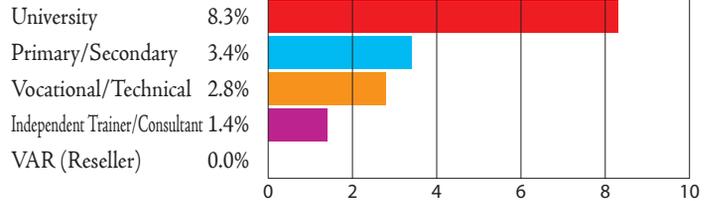


Percentage of each industry segment who have reported increasing staff in 2012.

AEC



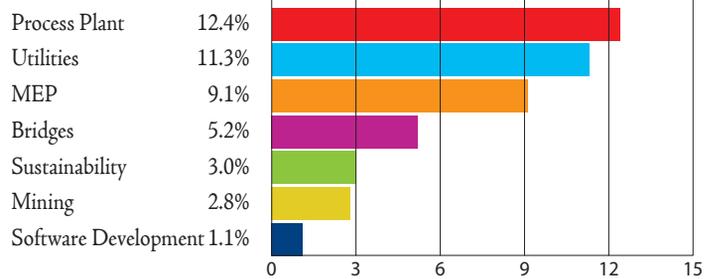
Education/Training



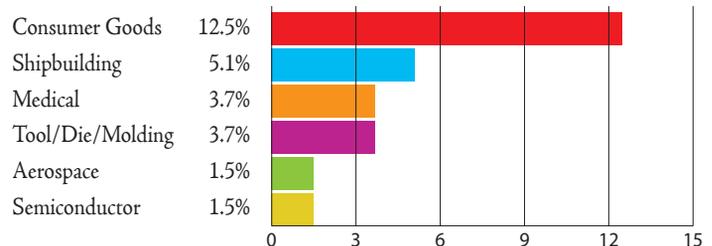
Electrical



Engineering

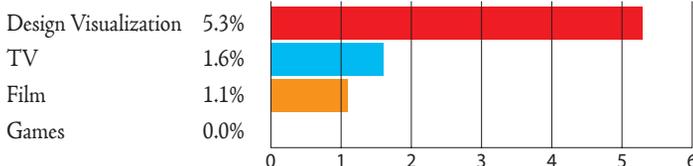


Manufacturing



According to McGraw-Hill's "Construction Industry Workforce Shortages" report, 86% of A/E firms are concerned about being able to find enough experienced staff for their 'green' non-residential construction needs.

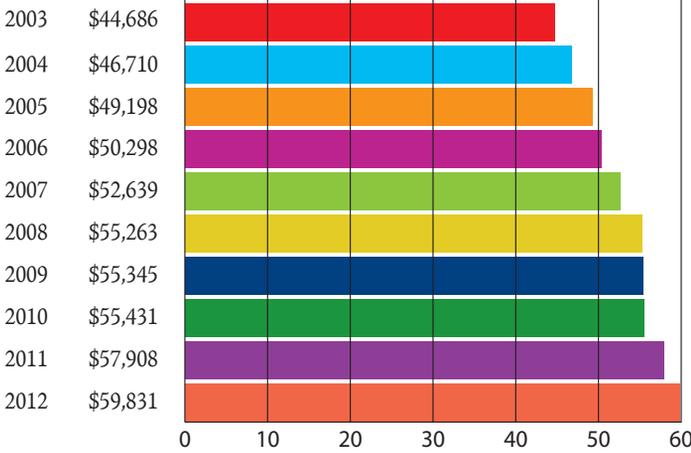
Media & Entertainment



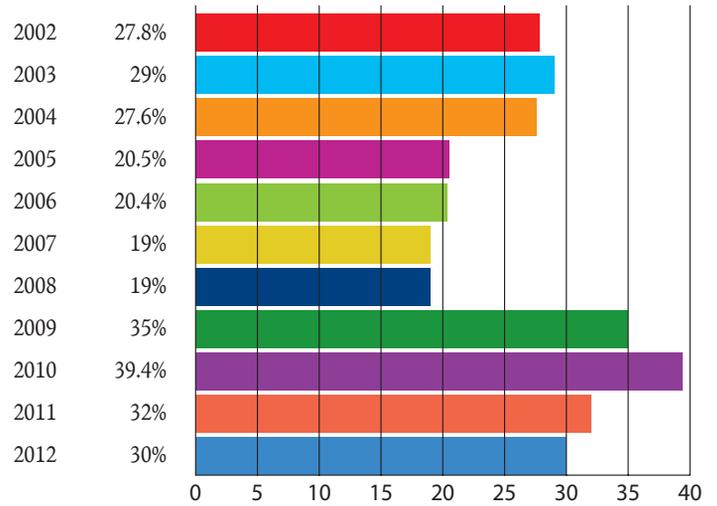
AUGI 2012 Salary Survey

A LOOK BACK

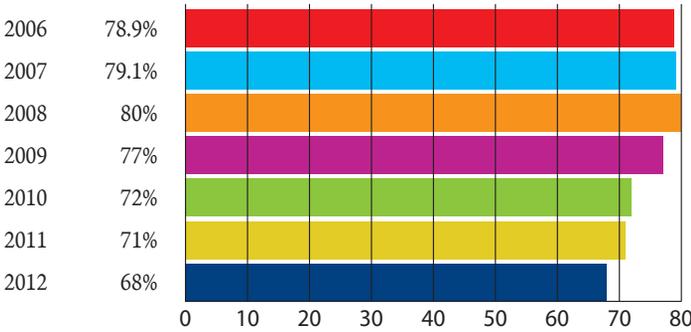
Average "Designer" Pay



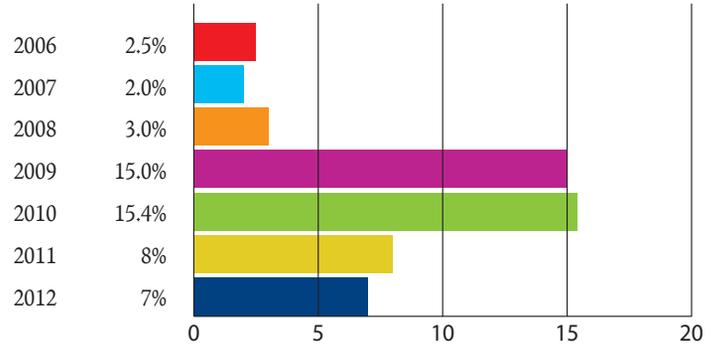
Percent of Respondents Who Received No Raise



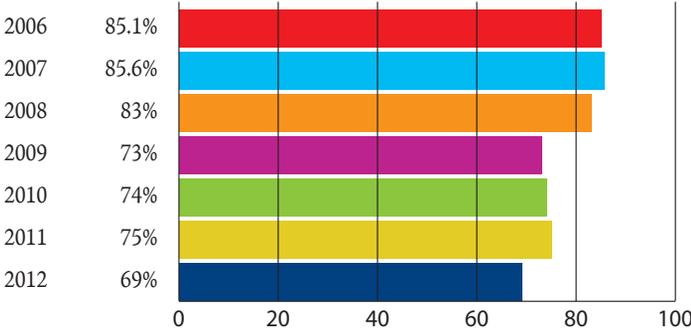
Percent of Users Who Are Satisfied



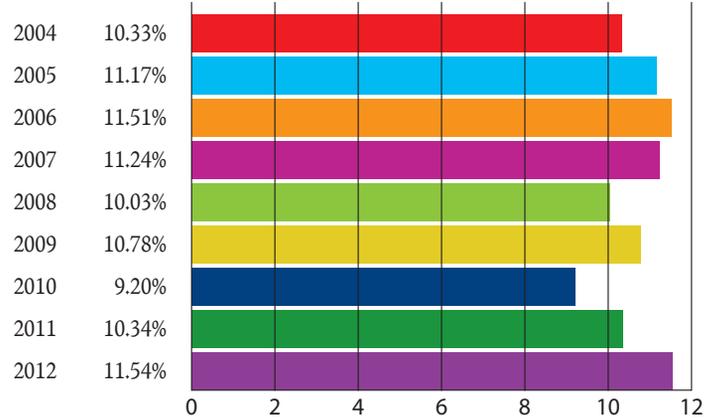
Percent of Users Who Experienced Pay Decrease



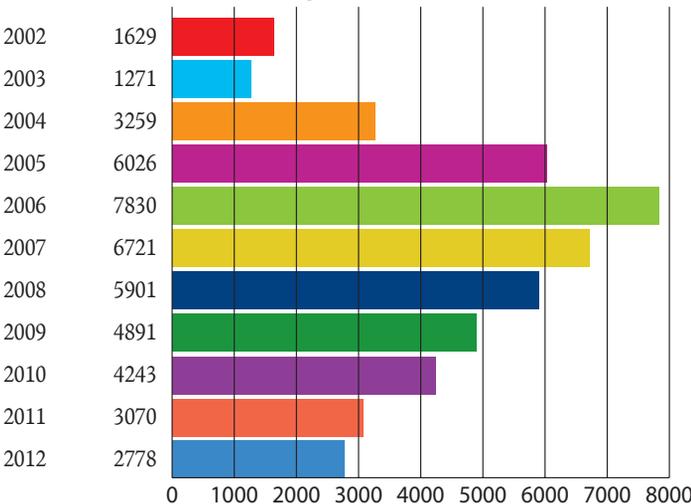
Percent of Users Who Feel Secure



Percent of Female Pay Difference



Responses to Survey



Melanie Perry is a Facilities-Management CADD Coordinator and a freelance Writer and Technical Editor. She is the AUGI Salary Survey Manager since 2004 and is currently serving as an Officer on the Board of Directors. Melanie can be reached at mistressofthedorkness@gmail.com, or found on Twitter as @MistresDorkness.

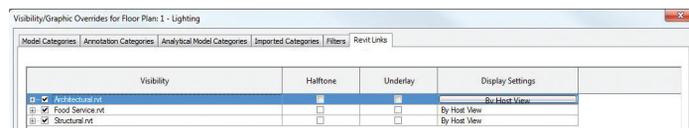


 Time is money and Autodesk® Revit® MEP has a reputation for wasting both. If you use Revit MEP or are considering it, this article will give you a framework for using it efficiently and effectively for your clients and profitably for your firm.

Over years of using AutoCAD®, the industry has developed a standard method of exchanging information in a logical and efficient way. The architect provides all the background files that MEP and other firms require for their drawings. Those firms change the layer colors to match their respective company's printing standard, xref the background files into their sheets, and begin their work. Some firms even have script files that automatically change the layers to the appropriate colors, or they use the layer manager express tool built into AutoCAD. When the architect provides an update, all the firm has to do is apply that LMAN file or run their script and overwrite the previous xref files. Rinse and repeat.

With Revit, this process has been more tedious. The beginning is the same—the architect provides the model along with any other linked models (as well as CAD files if a consultant isn't using Revit). The current common practice is for the MEP firm to link each of those files into their model, copy/monitor the levels and grids from the architectural model, and then create each of the

views they need. By default, these views are set to show each link “by host view.” All model elements, including reference planes, are shown simultaneously and the view is a jumbled mess.



Now the MEP modeler must go through each view to edit the visibility and view range in order to ensure a clean background. Sometimes plan regions need to be used in order to get the view to show just like the architect's. Every time there is an update, the MEP modeler must go through coordination review to make sure the grids haven't changed. He/she must also go through each view to make sure nothing has been added in the architectural model to affect the visibility modifications made during the initial setup.

Not only is this process inefficient, but it is a common point of failure where a change can easily be missed. As an example of the havoc this can cause, permit drawings were issued with incorrect grid lines for a job one MEP firm worked on because it wasn't noticed that the grids had changed during an architectural update. The architect was understandably upset that the drawings were incorrect. In order to fix this, the firm had to go through each view

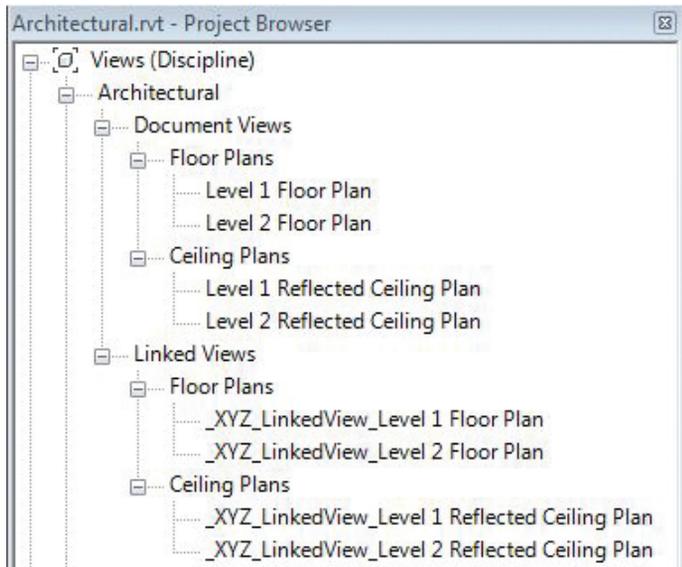
Revit MEP 2013

in the entire project and manually delete the grid lines that didn't belong there. Another downfall to this method is the MEP firm must also place spaces in the model for each room, on each level of the building, and then tag each one of those spaces. They must use the space naming utility or manually inspect the model to ensure that they have the most current room names. If any rooms were added in the architectural model (and this is not communicated to the consultant) that room name and number will likely not be shown on the consultant's drawings.

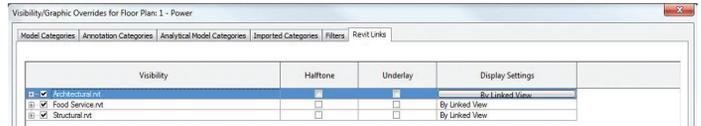
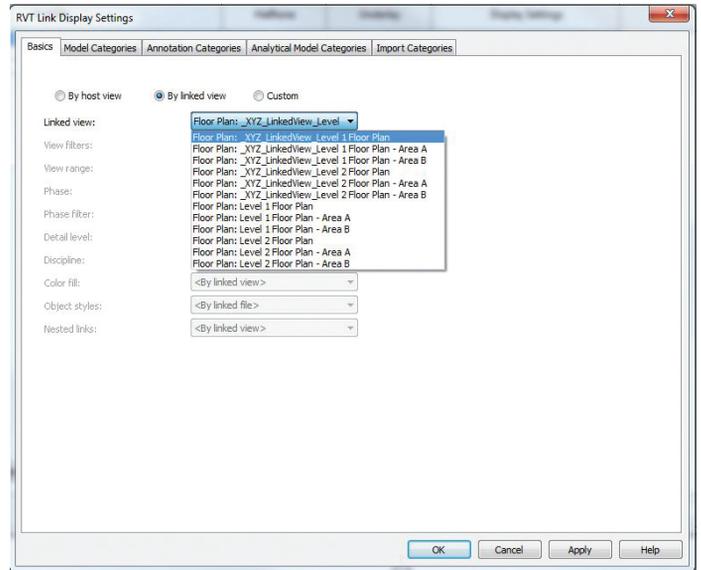
All of this adds up to frustration on all sides because the job is taking longer and costing more than it should, due to silly errors. Luckily, there is a better way.

INTRODUCING LINKED VIEWS

It's a shame that few firms know about this giant time saver. Put simply, linked views are specific views within a model that are set up to display exactly how the company that will be linking that model needs to see them. This is helpful because the architect can create these linked views by duplicating the views they already have set up for use in their drawing package. The architect can then make minor modifications based on the requirements of the MEP firm. Since they are duplicating an existing view, the view range and many of the visibility settings are already taken care of.

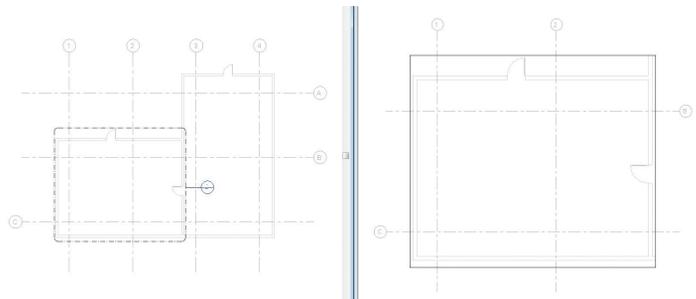


Let me walk you through this to show how easy and helpful it is. First, rename the view to have the company name (or an abbreviation), the words 'linked view,' and then the name of the view. For example, _Company_Linked View_Level 1. Now, when the MEP firm receives the architectural model, they copy/monitor the levels and create their views. Then, in visibility graphics, change the display settings for that link to display "by linked view." Use the drop-down to select the appropriate view from the list based on the naming convention mentioned previously. Their view will then show exactly how the architect set it up in the model. No further setup is necessary.



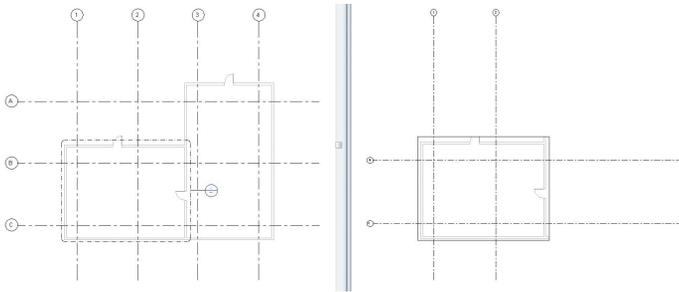
This works not only for architectural models, but also for any linked model (structural, food service, lighting consultants, and so on). Even MEP can set up linked views for the architect to use. For example, there can be a linked view setup for each level that shows only light fixtures and diffusers. Not only that, but the light fixtures can have the emergency hatch (or any other hatching the architect doesn't wish to see) turned off. This way, all the architect has to do is change the display settings for the MEP linked model to that particular linked view and they're done. Revit will even crop the view when callouts are created just as it would if set to "by host view." This is a huge time saver and ensures that everyone's models are properly coordinated.

Everyone's backgrounds now match exactly how the architect intended to show them and nobody wastes time trying to figure out how each linked model must be manipulated. All that is required to harness these time and frustration savers is some up-front communication and a clear list of settings developed by each firm to provide at the beginning of the project.



5 REVIT TRICKS SAVE HOURS OF FRUSTRATION

1. Grid lines in the architectural model must be set to 3D in linked views. If they are instead set to 2D, the grid lines will not crop for the consultant when a callout is created. This leaves you with a plan showing a small area of the overall floor and grids lines extending out to where the edge of the building would be. However, if the grid lines are set to 3D, Revit will crop the grid lines nicely around the called out area.



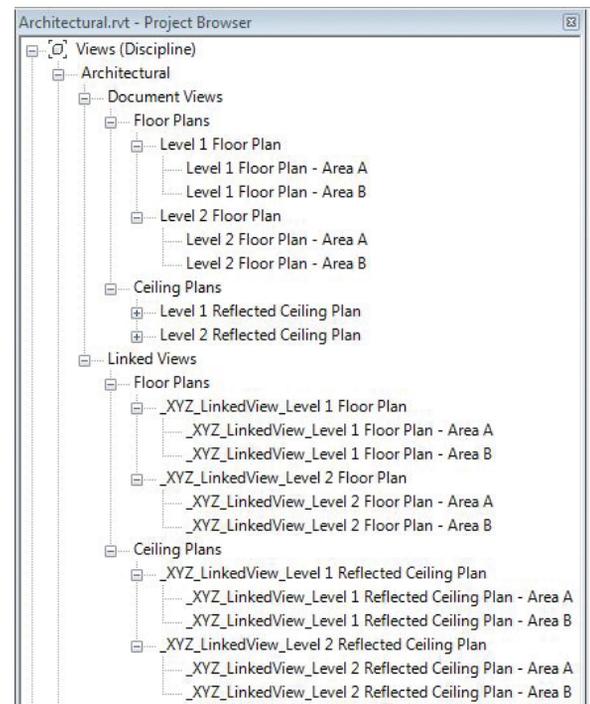
2. Text within the room tags in the architectural model should be set to transparent so it does not mask the work shown in the consultant's main model or any architectural background information. Since the room tags are located within the linked model, the consultant cannot move the tags around on their views. There may be instances where a symbol needs to be placed near a room name and if the text within that room tag is not set to transparent, it will mask the symbol.

3. Never (ever!) delete a linked view once it has been created and sent out for other companies to use. Here's why: Revit creates an ID for each view in a model and uses these IDs when referencing views. When a view is deleted, the ID is deleted with it. If you recreate that view, even with the same name, it is given a new ID. According to Revit, it is a whole new view and any associations created with the first linked view will now be broken.

To drive this point home, here's a common scenario. A consultant has the view set to a linked view called `_Company_Linked View_Level 1` and then receives an update where that linked view has been deleted and recreated. They won't see the difference because the name is the same and will proceed with the update. However, once they open their model they will notice that the Level 1 views are showing incorrectly and are set back to "by host view." That consultant will now need to open every Level 1 view in the model and associate them with the new linked view.

Therefore, to harness the power of linked views, it is important not to delete linked views once they have been put in use. Renaming is okay, but do not delete!

4. If the drawing package for a building is broken up into multiple sheets to show enlarged areas of a level, create an overall parent linked view and then create the area linked views with the "duplicate as a dependent" option. Use scope boxes to crop each dependent view to the correct area. This way you only need to make



visibility changes to the parent view and those changes will automatically occur on the dependent area views, saving you time.

5. Communication is your best friend when it comes to Revit. Don't be afraid to pick up the phone and call the person who sent the model when necessary. This is the best method we can all use to help each other save time and alleviate headaches and frustration. Each company knows how the model and families were put together and it will take the owner of the model significantly less time to make modifications than it would for anyone else.

Revit is a new tool that promises more information, quicker turn-around, and better coordination. Just as with any new tool, we must all work together to find the best ways to harness those promised advantages while minimizing the learning curve and the pain of newness. Follow the suggestions in this article and you'll have a whole new view of Revit.



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Quick Fixes for Small Errors

WHERE DID THAT MODEL GO?

 In many projects as you navigate the corridors of your model, you may notice that if you are in just the right view, the entire model disappears. Or other times, as you rotate your view it may become invisible even though nothing is obstructing what should otherwise be a visible area.

What is happening is that Autodesk® Navisworks® is assuming a culling plane. The plan hides everything in that scene area. To overcome this, we will use the File Options tool. Click the Home tab of the ribbon > Project Panel > File Options.

In the fly out, the first tab is culling. To fix the random culling areas we will update the clipping plane information. I suggest changing near clipping planes to 0 or .001. This will ensure that near objects are not culled. If you are having performance errors

with far away objects, change the far clipping plane. Users beware when changing the far culling plane: when this number is changed and as you zoom out far from the model, the entire model will be culled. In other words, the model will disappear.

If you ever want to reset these numbers you can click reset to defaults or simply change the clipping planes back to automatic.

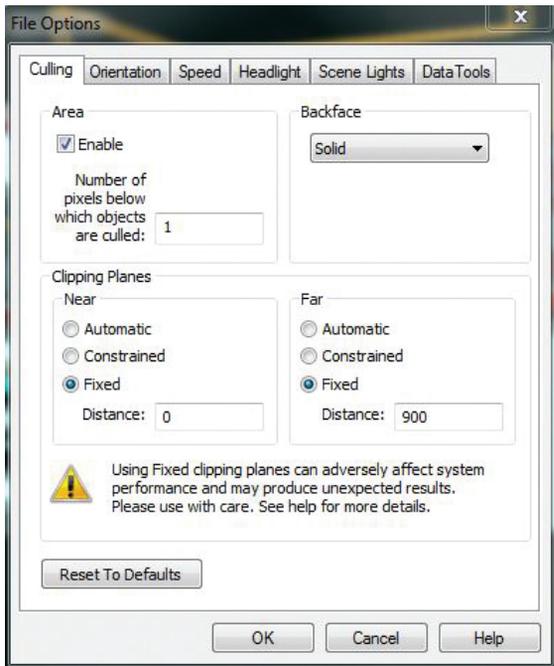


Figure 1: File options fly out.

WHO TURNED OFF THE LIGHTS?

There are many lighting settings in Navisworks. Changing the general lighting will help illuminate a number of issues in the project.

To change the general lighting, click the Viewpoint tab of the ribbon > Render Styles Panel > Lighting. The default lighting mode in Navisworks is Headlight. This mode projects a light from the camera. The setting for this light can be modified with the File Options tool. Open the File Options tool Home Tab > Project Panel > File Options and click the Headlight tab. Adjust the slider bars for the ambient light and headlight settings and notice how the scene view changes. Because Headlight is the default lighting setting, correcting it to the way you wish to illuminate the scene view can save you time in the future.

Full Lights illuminates the scene according to lights that have been placed with the Presenter tool. This requires more customization, but can have great lighting effects on the model.

No Lights removes lighting from the scene view, rendering all objects with the same lighting style. No lighting contrast or depth will be seen.

Scene Lights, the final lighting style, will apply lighting to the scene view according to the native lights imported into Navisworks. If, for example, you bring in a model from Revit with lighting embedded in it, the Scene light style will render the lighting in the model according to the position of the lights in the model. If no lights are present, Scene lights places two default opposing lights to illuminate the area. This setting can also be customized with the File Options tool. Home Tab > Project Panel > File options tool. Click the Scene Lights tab and adjust the ambient slider bar to customize how the lighting affects the model.

WHERE DID I LEAVE THAT GIZMO?

During the course of coordination, it is not uncommon for you to use Gizmos for a number of reasons. For example, a good practice during a coordination meeting is to “play pretend” to see if changes to one model will reveal a coordination issue. For example, the plumber in a meeting might ask if, by lowering his roof drain 2”, it would eliminate the ducts clash and still keep the plumbing above the ceiling. In order to check this for him, the coordinator should select the offending roof drain pipe, then select Move from the Item Tool tab of the ribbon > Transform Panel > Move tool. When this tool is selected, the Gizmo should appear right in front of you. Although this happens often, it is just as likely that the Gizmo will appear somewhere else.

The best way to get the Gizmo to come back to the scene view you are viewing is to unclick the Move Tool then relick the tool. If the Gizmo does not appear in the scene view, you will have to navigate to find it. The Gizmo will sometimes appear in faraway places because it is trying to appear approximately in the center of all the objects you selected. Some objects when selected also select other primitives that are located far from the first object. This causes the Gizmo to appear in seemingly random places.

NAVISWORKS CRASHED AND I DON'T KNOW WHERE THE AUTO-SAVE IS!

If you are asking yourself this, don't panic. The Auto-Save file still exists. To find the directory for your Auto-Save files, click the Application Button > Options > General > Auto-Save. In this window you can view the location path of the directory containing your Auto-Save files. Simply find the nwf that corresponds with the project that you wish to restore.

The Auto-Save options also allow you to set the interval of when Navisworks creates the Auto-Save file. This can be important if you are working with a large file and are in the middle of a coordination meeting. Though I highly recommend

Navisworks Manage 2013

using the Auto-Save feature, I often disable it before a meeting because of the time it takes to actually save the file. I turn it back on after the meeting and I always have it on while I am working in Navisworks because I don't want to lose any of my work. However, since the bulk of the work should be done before a coordination meeting begins, a remarkable amount of time is saved by disabling this feature before a meeting.

The Auto-Save options also allow you to decide how many iterations of the project you wish to save. Changing the value of the Maximum Previous Versions will change how many different Auto-Save files Navisworks will create per project.

WHERE ARE RECENT FILES?

Many times, you may wish to modify how Navisworks displays your recent files list. To view your recent files, simply click the application button and view the right half of the menu. A number of different files will appear in the recent files section. Above all the recent files is a drop-down, which allows you to organize your view of these files with the following options: By Ordered List, By Access Date, By Size, and by Type. Changing this setting allows you to change the order in which your recent files are displayed.

If you desire to show more of the recent files in your Recent Documents list, click the Application Button > Options. Expand General and select Environment. You can change the number of recent files from 1-16.

Navisworks also gives you the benefit of using push pins in the Recent Document list. If you click the push pin next to any of the files on the list, they will never be removed from the list. To un-pin a document, simply click the pin again and it is released.

WHY ARE THE MODELS DIFFERENT SIZES?

Occasionally when you are setting up a new project you may notice that one of your models is significantly smaller or larger than all of your other files. When you encounter this, you can quickly identify it as a units problem. Right-click the offending file in the selection tree. Select Units and transform in the context menu. Navisworks will always default to a specific unit for a given data type and sometimes a file comes in at different units. Because of this, Navisworks gives you the option to change the units in which the model is displayed. In the Model Units section click the drop-down and change the units to the desired unit. When you click OK, the model will scale accordingly.

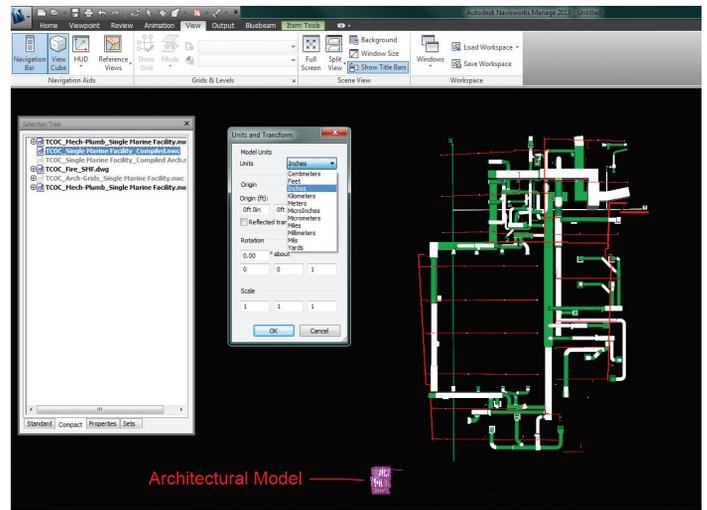


Figure 2: File units problem.

THERE'S NO PLACE LIKE HOME

Occasionally there will be a model in the project with extreme extents. This causes distortions when you click any part of the view cube, including the home button. Navisworks provides a way to handle this error. To set a home view, navigate to the location you wish to set as your home view, right-click the home button on the view cube, and select set current view as home view from the context menu. This customization allows you to more quickly navigate the model and extends to the Clash Detective by allowing you to view any clash in context of the home view.

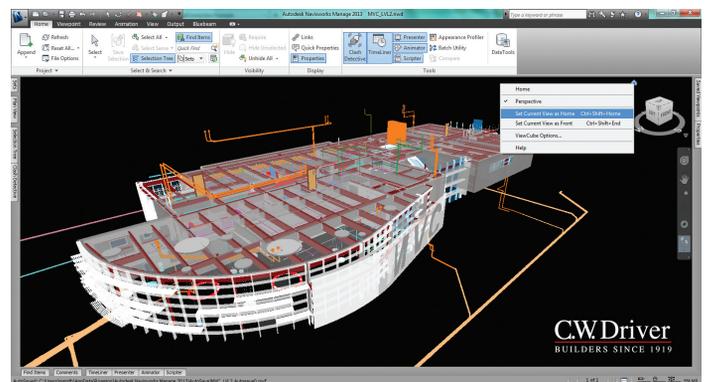


Figure 3: Setting the Home View.

Now that the home is corrected, the panels of the view cube still zoom in correctly. This is because of the large extents of the files in the project. Remember, the view cubes' zooming function are defined by the extents of the project. This can, however, be changed. To change the extents the view cube follows, select the objects that you wish the view cube to zoom around. This is typically the main building you are working on. Once selected, right-click the view cube and click lock to selection. The view cube will now rotate correctly.

SHORTCUTS

It's nice to know the shortcuts in every program so you can quickly accomplish tasks. The most useful shortcuts for me involve switching between tools. Unfortunately, Navisworks does not allow you to customize shortcut keys in release 2013; this feature was removed in 2012. However, there are still a number of important shortcuts that allow you to quickly accomplish your work.

Ctrl + 1 activates the select tool. New in Navisworks 2013 is the handy ability to be able to toggle the select tool to select box by pressing the spacebar.

Ctrl + 2 activates the walk tool. This useful tool allows you to navigate the model in a perspective view. Clicking the middle mouse button allows a camera pan mode, and rolling the scroll ball allows you to adjust the angle for viewing the scene view.

For a complete list of shortcut keys see the Navisworks help system Default Keyboard Shortcuts documentation.

Another way to increase your efficiency is to add common tools to the Quick Access toolbar. This bar is located directly to the right of the application button. To add a tool to the Quick Access toolbar, simply right-click the tool and select add to the Quick Access toolbar. The tool will then persist in that location, giving you quick access to it.



Figure 4: The Quick Access toolbar.

WORKSPACES, AVOID THE CLUTTER

One very powerful tool that is rarely used in Navisworks is the workspace tool. This tool allows you to customize the location of all the different windows in Navisworks. To create a workspace, simply arrange all the windows you wish open, such as saved view-

points, clash detective, selection tree, and selection sets. Then click the View tab > Workspace panel > Save Workspace. You can choose where you wish to save the xml file.

This comes in handy when you switch from two monitors to a single monitor. You can create two different workspaces and, using the Load Workspace command, you can quickly toggle between the two.

PUTTING IT ALL TOGETHER

When set up, these tips and tricks allow you to efficiently run Navisworks. If Navisworks has a hiccup, there is usually a way to control the behavior. This article has reviewed how to handle a number of these negative behaviors. If Navisworks behaves poorly for you, always try closing the program and opening it again. Otherwise, submit the problem to Subscription and the AUGI Wish List. Feel free to email me with questions and concerns.



Michael N. Smith is a BIM Manager for C.W. Driver, a large general contractor in Southern California. The firm is highly regarded throughout the design and construction industry for implementation of BIM innovations on each project, and for creating customized software plug-ins to increase the efficiency of the latest software releases. Michael is a guest author and technical editor of Mastering Navisworks 2013 and instructor for Cad Learning's Navisworks 2012 and 2013 Series. He has spoken at Autodesk University, ASHE PDC, CASH, and other conferences. Most recently he started Blink Forward, a revolutionary approach to make pdf construction documents smart. He can be reached at msmith@cwdriver.com.

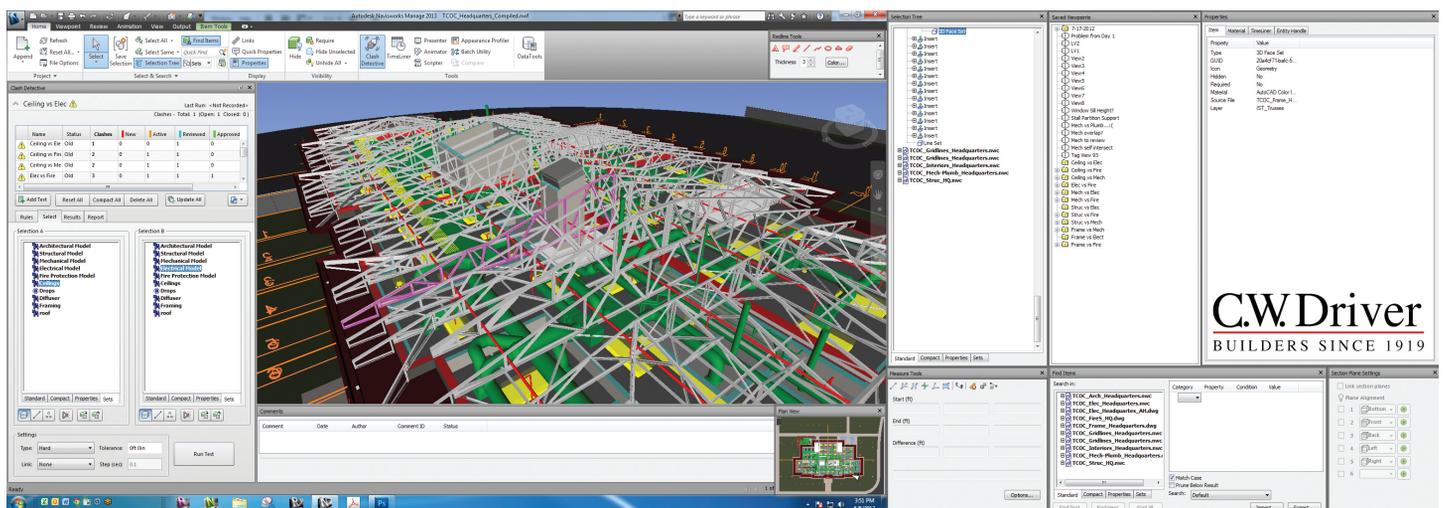


Figure 5: Efficient workspace.

Consistency Through Templates

The seasoned AutoCAD® user knows that when setting up a template for complex plans, getting the right look requires creating layers with the proper line color, weight, and style.

We also want to achieve the same looks with Autodesk® Revit® Structure. Building a series of templates for different types of views and including this in your model template will produce a consistent look between Revit Structure and AutoCAD as well as easier and more efficient modeling.

THE VISIBILITY GRAPHIC OF STRUCTURAL ELEMENTS

If you take a look at the drawings printed directly from a file created with the default Revit template, the drawings will not look at all like structural plans.

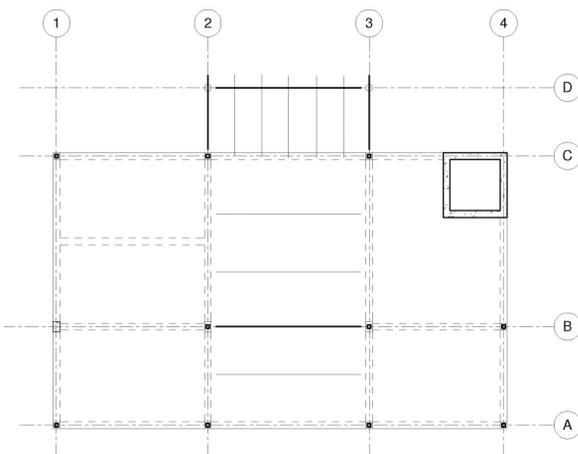


Figure 1

Note that the beam line weight and line pattern is defined by the default structural function assigned by Revit. Most of the steel beams will not be defined as “Girders” but as secondary beams (Category “Other” or “Purlin” or “Joist”), so they will be drawn with a very light line weight. There are two ways to correct this.

1. You can laboriously change all the beams which are not girders to “Girder,” one beam at a time; or
2. You can use a template with user-defined filters and property overrides from the start.

For concrete columns and shear walls you can use also a filter and property override to change their visibility. Since these elements tend to look small on the drawings, we are accustomed to shading them with a light grey pattern.

For the rest of the beams types (concrete or wood) we can simply manipulate visibility in the “Visibility Graphics” window. The “Girder” and the “Other” beam categories should be defined with the same line weight.

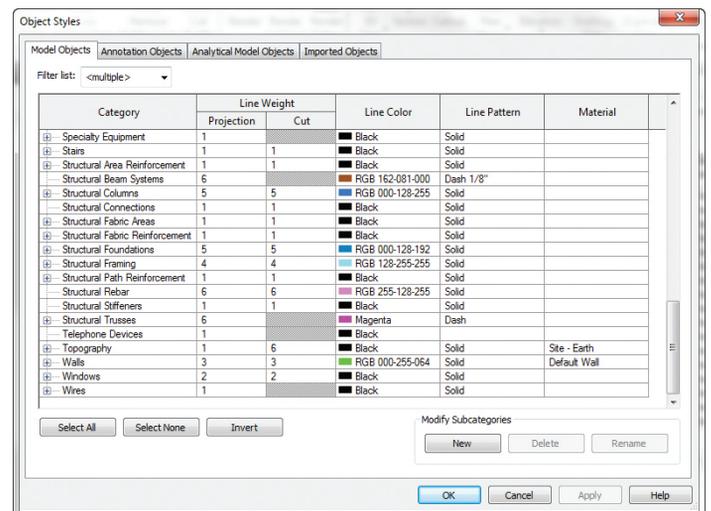


Figure 2

In my experience, it works much better if you also change the colors in “VG” to the colors you use in AutoCAD because it is very hard to distinguish structural elements on plan views. (I normally reverse the background so it looks exactly like a CAD plan.)

If you are working on a foundation plan view, you will need to adjust the line thickness and line type of the foundations. Follow your company standards in determining line weights.

An “out of the box” foundation plan view looks like Figure 3.

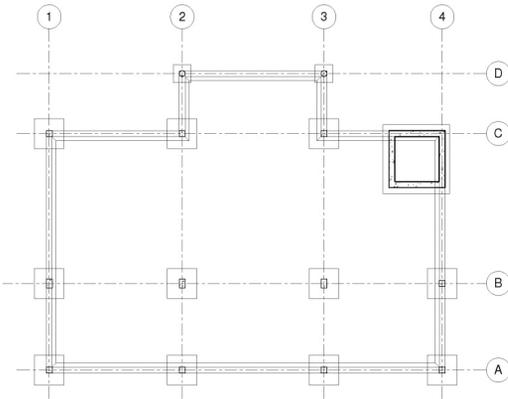


Figure 3

Depending on your standards, the foundation plan view *should* look like Figure 4.

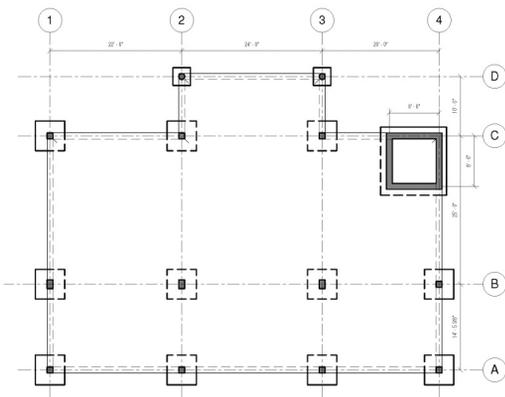


Figure 4

CREATING FILTERS

To begin setting up your template, open the Filters window (Figure 5) and create the filter names.

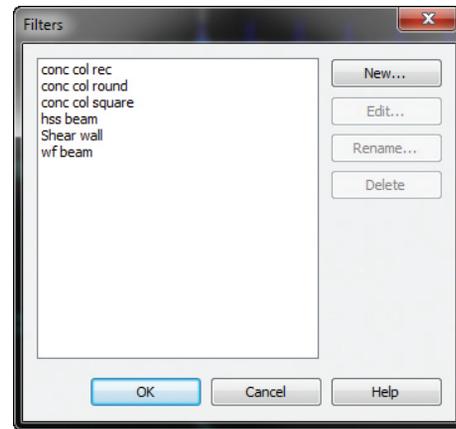


Figure 5

Steel Beam Filter. Type a new name for each steel beam family, then from the list of categories select “Structural Framing.” Next set up the filter rules. We will filter by the “Family Name” equal to the types of beams on the drawing. There will be as many steel beam filters as different steel beam families you use (WF, Bar Joist, HSS, etc.).

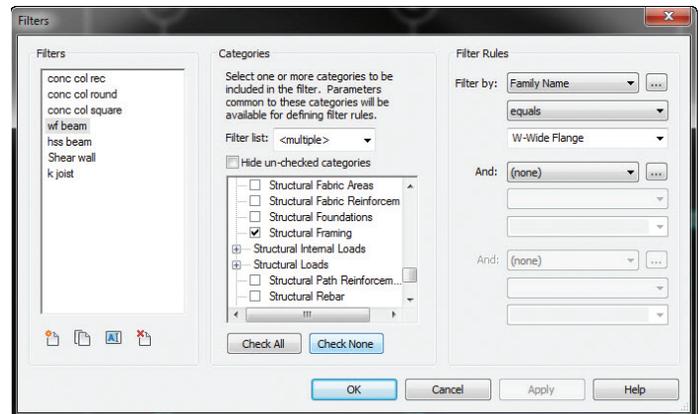


Figure 6

Concrete Column Filter. Repeat the steps from the Steel Beam Filters except select the “Structural Column” category. Here you will also need to define multiple filters for your various family types (rectangular, square, round, etc.).

Shear Wall Filter. To create a filter for shear walls you have to define the shear wall types as “Core-Shaft” walls (that is the function of the wall). This way if there is more than one type of shear wall the filter will still work. The procedure is the same as before: for Category pick “Walls,” then at “Filter Rules” select “Function” and “Core-Shaft.”

Now that all our filters are set up, we are ready to create the Visibility Graphic overrides.

VG OVERRIDES

Open the “Visibility Overrides” window in the plan view. Open the last tab, Filters, and add all the filters you just created. For each filter create an override for “Projection” and “Cut” surfaces according to your standards.

Revit Structure 2013

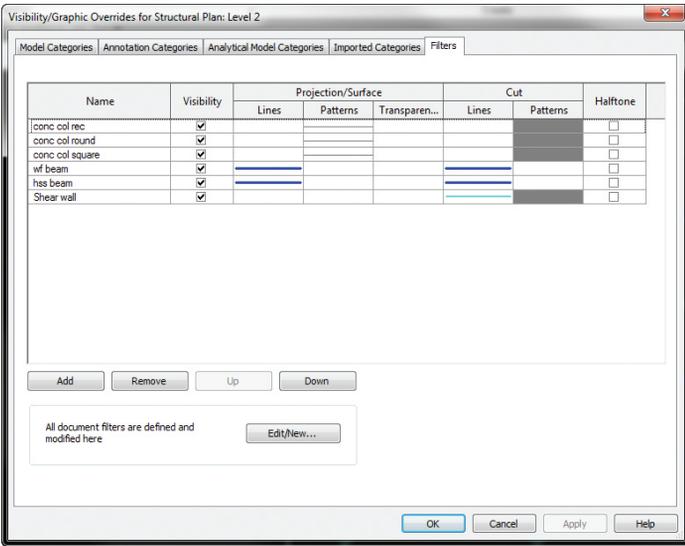


Figure 7

When all the overrides are done you can save this plan view as a “View Template” to be able to use it on the rest of plans. For foundations you should create a separate view template.

The prints from these plan views will now be more readable and will comply with your company’s AutoCAD standards.

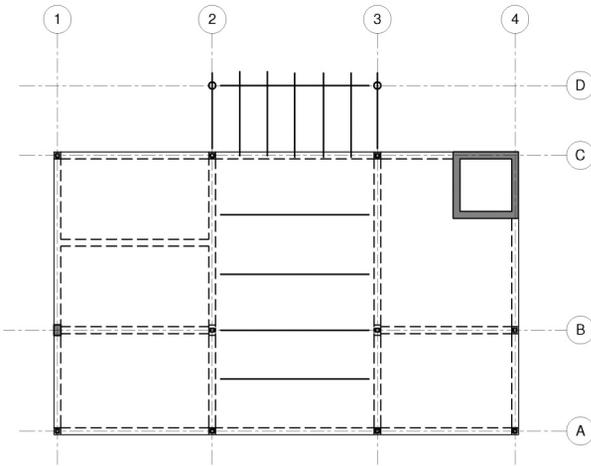


Figure 8

On plans containing steel and concrete beams, the usual practice is to call out the steel beam size on the plan but schedule the concrete beams.

To get this result we need to create a special tag family for the concrete beams.

CONCRETE BEAM TAG

Open the existing “Beam Tag” family. Double click the “Label” and change it to from “Type Name” to “Mark.”

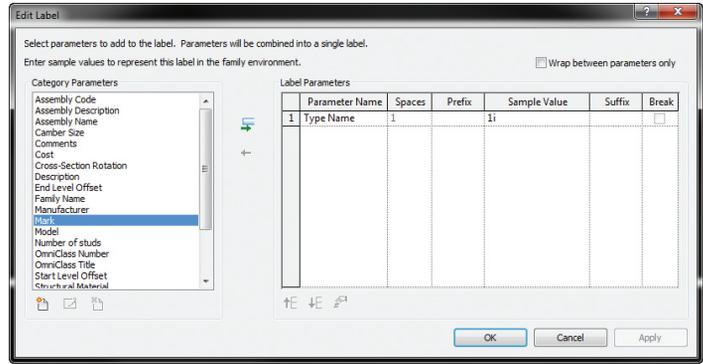


Figure 9

Save the family with a different name and load it into project.

Now when tagging beams the concrete beams will be tagged with your new tag and steel beams with the default tag.

VIEW/MODEL TEMPLATE

You can see that it is very useful to create a Revit template that corresponds to your company’s CAD standards. This template should include all your overrides, modified visibility graphics, dimension styles, text style, custom families, custom line weights, and patterns. The template can also include schedule set up as well as custom line and pattern type for detail lines.

The project where you first defined the filters can be saved as a template or the view templates can be transferred to other projects. This way, your Revit drawings will be easier and faster to create and readable by any structural engineer.



Anamaria Brown is the owner of AMB Structural CAD, an AutoCAD and Revit consulting firm that specializes in drafting complex AutoCAD projects and Revit modeling. A structural engineer in her native Romania, she escaped to the United States in 1985 and almost immediately began working as a drafter for Skidmore Owings Merrill at the beginning of the CAD revolution. Deeply involved with Draft, Microstation, and the development of SOM’s AES, she quickly became the major projects CAD team leader for SOM and later for Epstein and Sons and Thornton Thomasetti. As a member of the National CAD Standards Committee she was involved with the creation of Version 3 of the NCS. Most recently she worked for TRC Worldwide in Sarasota, Florida. You may contact Anamaria through her website, AMBStructuralCAD.com.

Follow the Money— The Climate in Archviz



➔ **3**D visualization artists are in a field that has seen significant changes in recent years, and we are tasked with stretching beyond the traditional approaches to working and doing business.

I spoke to four major players in visualization, including artists, educators, and business development professionals. Their insights about client relations, technological trends, advancements, and challenges help to illuminate the continuing development of the Viz industry. By all accounts it will be the ability to remain flexible and mindful of new opportunities and innovations that will allow digital artists to thrive, and determine the future viability of 3D Visualization.

Since everyone we spoke to is quite busy—which is a good sign in itself—it made sense to raise only three questions, hoping to boil down the intricacies of the business as much as possible.

WHO WEIGHED IN?

Robert Becker, CEO of Presenting Architecture. Presenting Architecture is a comprehensive curated resource directory of architectural presentation specialists, including communication experts, physical model makers, photographers, and visualization artists. www.presentingarchitecture.com

Ted Boardman, Authorized Autodesk Master for 3ds Max, educator, trainer, award-winning author, and columnist. Ted has enriched the world of 3D visualization from its earliest days and continues to contribute to the community through writings and seminars. www.tbmax.com

Lon Grohs, Vice President, Business Development at Chaos Group. A past principal at Neoscape, Lon works with Chaos Group partners and customers, developing strategic market initiatives and promoting advancements in rendering technology. www.chaosgroup.com

Kitty Li, Founder and Managing Partner at LIK Group, and Co-Chair of the Asian/American Designers Forum. LIK Group is a full-service studio, serving the architecture, building, and real estate development industries. www.likgroup.com

Q: HOW HAS THE TYPICAL CLIENT PROFILE CHANGED OVER THE LAST 5 YEARS?

Lon: Follow the money. Having seen AEC from multiple perspectives, it is clear that developers and owners make up the growing majority of high-end Viz clients. Developer's assume more financial risk and have more at stake.

Kitty: It is usually preferable for us to work with the end user of the products we produce. Even when multiple organizations are involved on a visualization project, the ultimate decision comes from the person who is paying it. For 90 percent of our projects, our fee comes from the developer's direct or indirect billing.

Ted: As an educator, my clients are architects, developers, and contractors who would like to incorporate 3D visualization into their in-house workflow. Five years ago, clients were ready to roll up their sleeves and learn 3ds Max. Today, I typically

have clients requesting that I only “teach them to do photorealistic renderings.” The marketing of many 3D packages has led them to believe that the process of visualization is simple, but they are not prepared for the depth of knowledge required to produce exceptional work.

Robert: Diversification is just smart business. My typical client has changed a little bit to smaller firms—and not always architects, but often planners and developers looking to show their venues in early conceptual design. From everything I have seen, far more of the visualization work has been *in-sourced* than many people might think. SketchUp is the basic in-house solution, and just before the big slow-down, many assumed that a lot of work was getting sent out to cheaper overseas shops. Though that did start to happen, I’d say upwards of 80 percent of all visualization is done by architects in-house. During the downturn, architecture firms wanted to keep their staff busy. The thing all visualization firms will have to do is to make standout presentations and provide a product that is beyond what can be done by architects themselves.

Q: WHAT ARE SOME OF THE EMERGING TECHNOLOGIES AND MINDSETS THAT WILL HELP TO SHAPE THE FUTURE OF THE WAY WE WORK?

Lon: Software that takes advantage of cutting-edge hardware may be the most significant factor to consider. New architecture called Kepler is the evolution of the current Fermi. NVIDIA just announced Maximus 2.0, using Kepler architecture, opening the door for real-time ray tracing and global illumination. Beyond quality of work, this directly affects the artists’ quality of life. CG artists can actually go home at 6 PM instead of 6 AM the next day. Tasks such as look development (materials and lighting) can be accomplished in hours, not days.

Software continues to improve. VRay Real Time and VRay for Maya are both maturing, and are more powerful than ever before. Real-time rendering engines will affect the industry immeasurably.

Robert: 3d printing is going to boom; it’s getting quicker, better, and cheaper. Animation may become the norm even on smaller projects. The firms that can efficiently incorporate new technologies as well as grow on the artistic side well will benefit greatly.

Kitty: Hardware advancement will help the efficiency of production, but visualization, by nature, is a creative production process and will always rely on talented artists. The fact that tools are getting better can only help.

Ted: In the near term, some productivity gains can be accomplished by specialization. More use of compositing software such as Autodesk Composite or Adobe After Effects allow projects to be created in layers that are more easily and efficiently manipulated and edited “on-the-fly” to provide a richer experience for the client.

In the long run, computer games technology and workflow should become more important to 3D Viz by providing a rich and far-reaching immersive experience that can be accessed and viewed on a wide range of devices.

Q: CONSIDERING THE FAR REACH OF 3D WORK IN ENTERTAINMENT AND AEC, WHICH AREAS OF THE INDUSTRY SHOW THE MOST POTENTIAL FOR GROWTH? AND IN WHAT PARTS OF THE WORLD?

Lon: AEC is a very strong market for Viz. The importance of gaming is that it has been at the forefront of getting CG directly into the hands of millions of people.

Canada, Brazil, and Australia are major players even now, but the thing to be aware of is the trend toward localization. In places where there is growth in construction there will be growth in the local Viz market. As things in the global market slowed, the element of risk became more influential in decision making. Issues concerning communication and cultural differences helped to fuel the widespread inclination to work locally. Also important to consider is the relative scale of CG production houses around the world. Top-ranked companies in the US rarely exceed 50 employees, whereas in Asia a large Viz house can have as many as 2,500 people. It’s even conceivable that, as things improve and relative values of currency evolve, the US could become a viable outsourcing option.

Ted: I don’t see any one industry becoming a “growth” industry other than the occasional bubble and, given the global nature of communications, I’m not sure that any one part of the world offers more potential than others.

Robert: Interactive gaming will grow and many companies will market their AEC products in some form where interactivity in Viz will be used more extensively.

CONCLUSION

Whichever course the Viz industry may take in the future, it is clear that as artists, we will need to evolve in our thinking, planning, and execution—both of the business of art, and the art of business.



Tom Cipolla is a digital artist specializing in architectural visualization. Born in New York and trained as a classical sculptor, he transitioned to working digitally in 2000. Tom has taught foundry practice, sculpture, drawing and 3D software. His studio, Onion3D, is a consulting and animation studio located in South Boston, MA.

PROJECT SIMULUS

<http://labs.autodesk.com/utilities/kraken>
Autodesk Labs

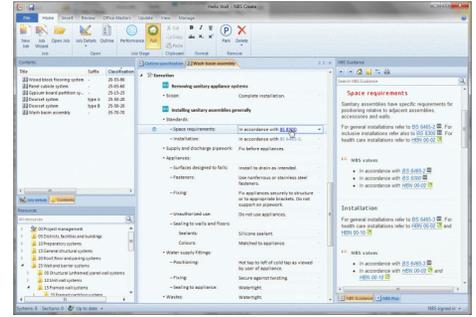
Project Simulus is a free* technology preview that showcases a number of innovative approaches to mechanical simulation using geometry modification capabilities through embedding Autodesk® Inventor® Fusion along with an intuitive simplification environment to prepare various CAD models for different simulation studies.

*Preview operates until **January 1, 2013**

NBS FOR AUTODESK REVIT PLUG-IN

<http://www.thenbs.com/products/coordinatingDrawingsSpecifications/NBS>

The NBS for Autodesk® Revit® plug-in is a free software tool that helps users of both Revit and NBS specification products to work more efficiently and accurately when generating their design documentation.



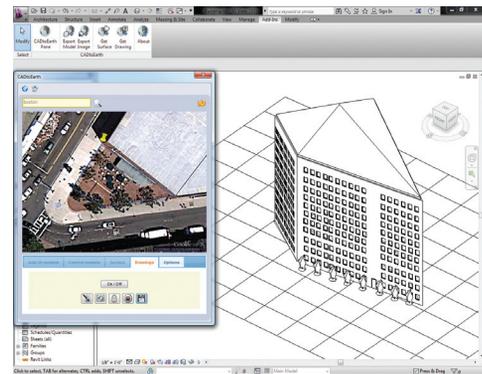
AUGMENTED REALITY FOR AUTODESK SHOWCASE

http://labs.autodesk.com/utilities/showcase_ar
Autodesk Labs

With the Showcase 2013 Augmented Reality plug-in, it is now easier than ever to visualize showcase 3D models in the real world as viewed through your web or video camera. With the Augmented Reality plug-in, Showcase scene environments can be more dynamic, allowing you to Imagine, Design, and Create in context to the world around you.

CADTOEARTH

<http://apps.exchange.autodesk.com/RVT/Home/Index>
AMC Bridge LLC

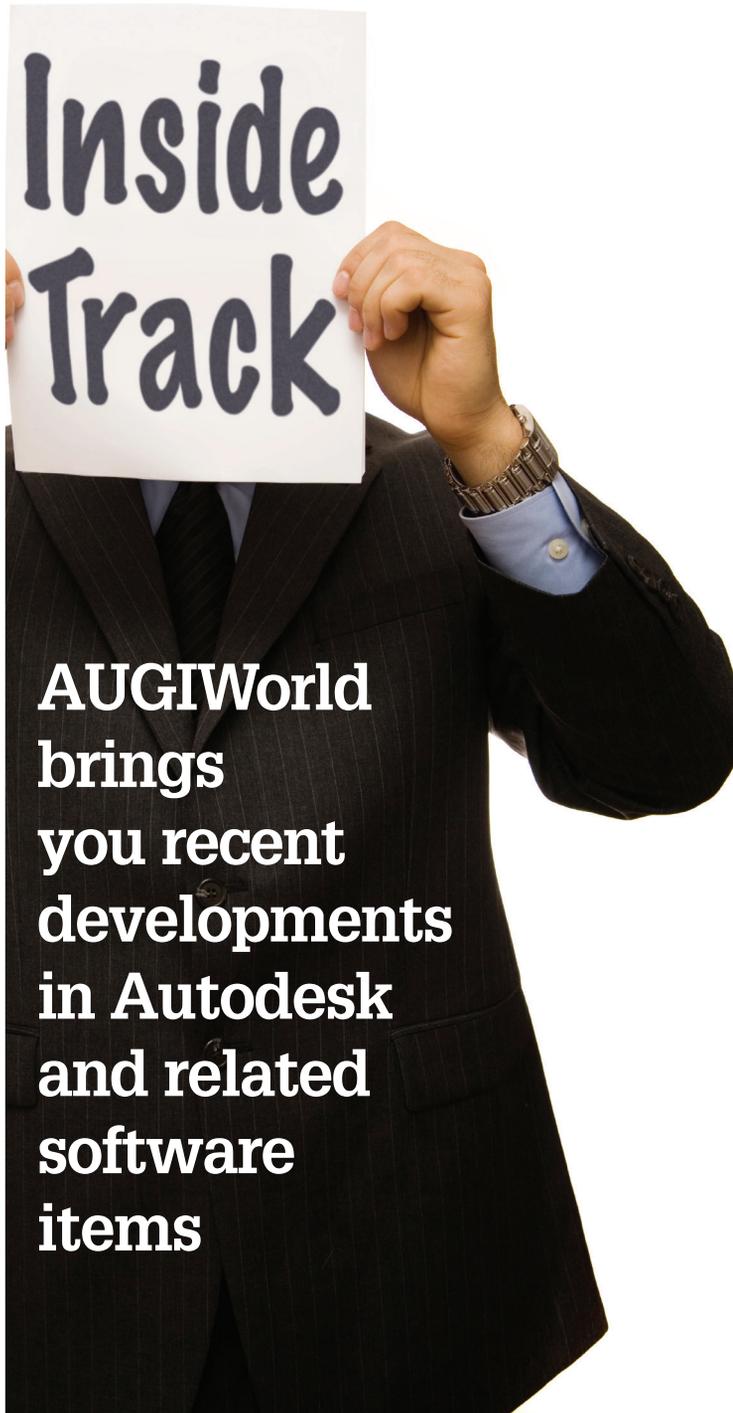


CADtoEarth offers some very exciting capabilities. Here is the partial list of what you can expect from the tool: Upload a model directly from modeling session onto Google Earth or Microsoft Virtual Earth; Import a section of the surface of the Earth directly from Google Earth into modeling session; Position your 3D structure on the imported surface within modeling session and then upload it back to Google Earth or Microsoft Virtual Earth; Perform the same operations on 2D objects in modeling environment and Google Maps.

FREE

Until next issue!

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



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