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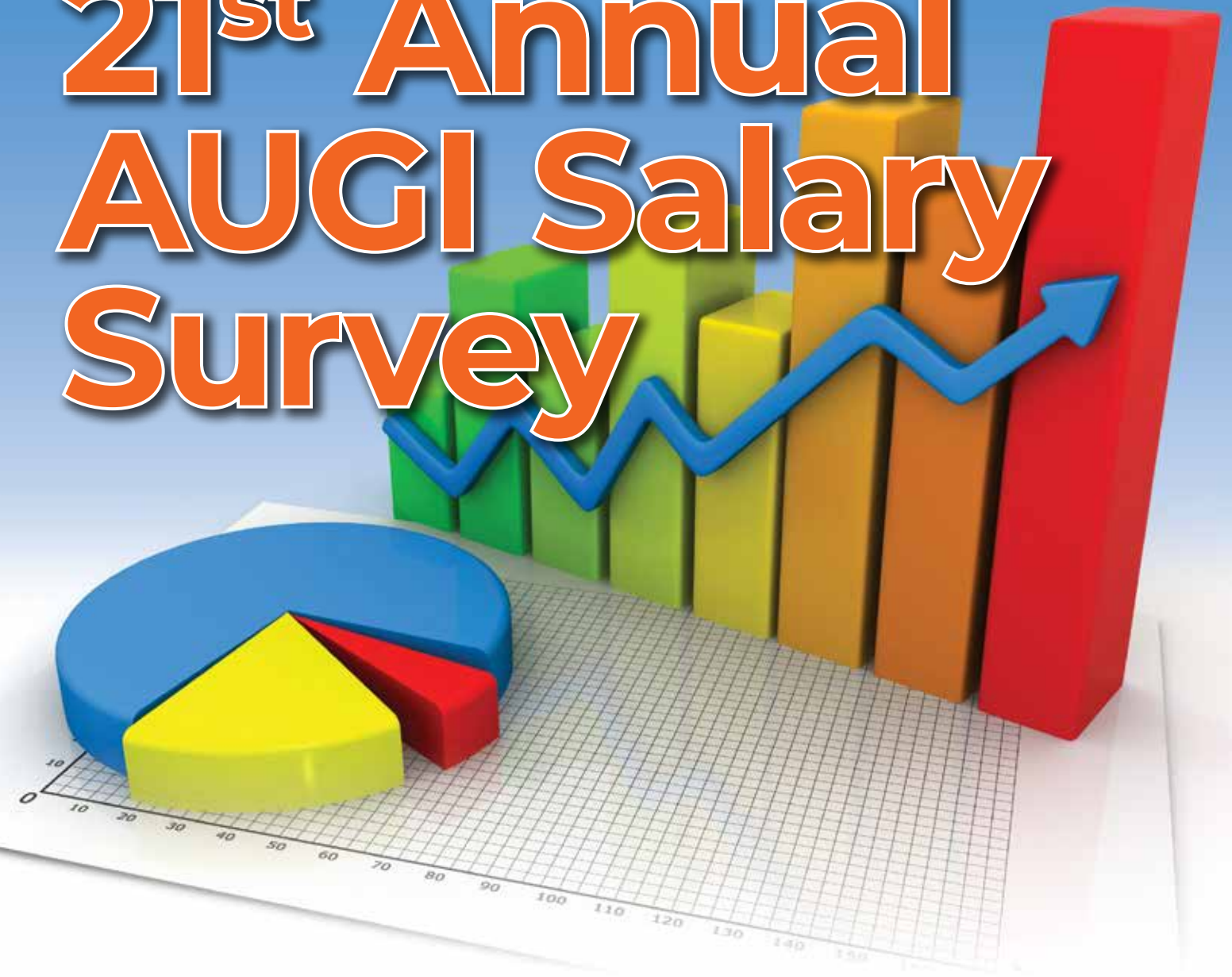


AUGI WORLD

The Official Publication of the AUGI Design Community

September 2022

21st Annual AUGI Salary Survey



Also in this issue:

Infoworks

3ds Max

AutoCAD

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From the President



IT'S TIME FOR THE SALARY SURVEY EDITION OF AUGIWORLD!

The salary survey is always one of our most popular editions as it provides people a way to gauge how they fit in financially within their industry.

In addition to the salary survey, the articles provided are a medley of topics. (We let the authors write about whatever they want!)

I decided that I should take this opportunity to discuss pay raises and salary negotiation.

I realize that some of you work for organizations where your pay is determined by a set scale, in those cases you will generally have a known list of items that need to be accomplished to increase pay or you may have to apply for a different job within that organization in order to increase your salary. Work with what you have available to you and do your research to know what that is.

If you are stable in your job and like where you work (or just don't want to switch jobs) it can be a bit harder to get a pay raise, but not impossible. So, what can you do? To start the process, setup a minimum of quarterly meetings with your manager. During those meetings establish and review goals that you want to accomplish and make sure to find a balance with goals you are interested in and that your manager wants for you. Be sure to communicate clearly and come in with some ideas that you've thought about before the meeting. Some other suggestions, be patient with yourself and management; set reasonable expectations; make learning a priority; take initiative and above all else, have a positive attitude! Finally, just like with a new job negotiation, do research on current salaries and bring that data to your manager to make them aware of industry standard pay.

In my opinion the best time to make drastic changes in your salary is when you are switching jobs. My suggestions (these have worked very effectively for me), do your research so you have a good knowledge of current salaries (this magazine provides a great start!). Create a unique resume for each job you apply for that targets the position, and don't disclose your current salary and if you are asked (they really shouldn't ask). Also, don't hesitate to give a higher number than you actually make that is based on your research. Plan to negotiate, now is the time as it's highly unlikely you'll be able to do so after you are hired. If you are asked to give a salary expectation, always go 10-20% higher than what you expect. Never accept the first offer as it would be extremely rare for that to be the best offer. Finally, if you aren't able to negotiate a higher salary, consider asking for increased benefits (like vacation time) and/or a signing bonus.

I've also had the company I was working for at that time come back with an offer to increase my salary based on what I told them I was going to be getting. So, if that is something you want, don't hesitate to use it as a bargaining chip. I know for myself, I personally decided to move on to the new company even though I was offered more money, because the new job would give me more flexibility and opportunities.

Whatever you do, don't underestimate what you have to offer!

Sincerely,

KaDe

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3ds Max Video Compositing with 3DS Max – Part 1

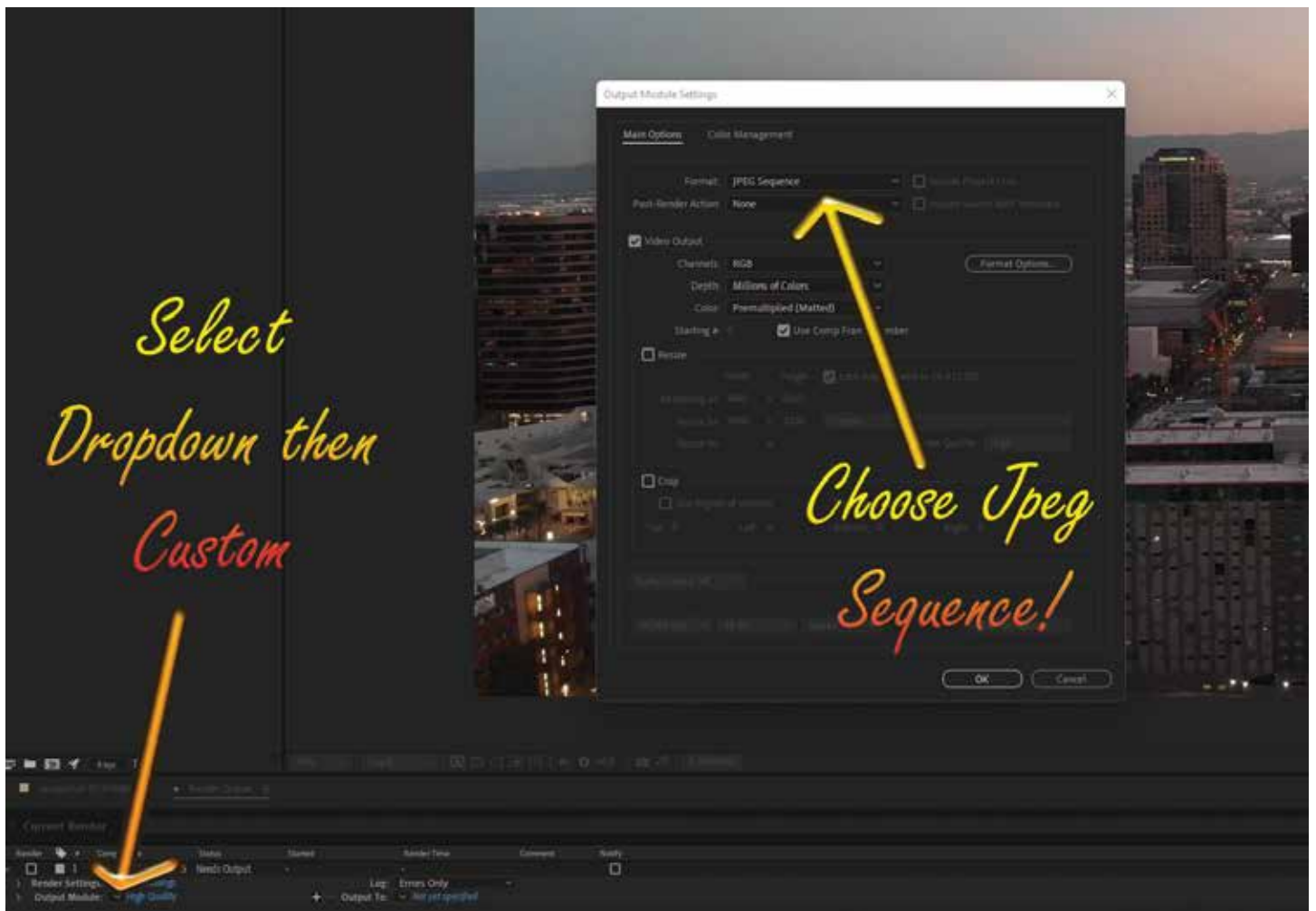


Figure 1

One essential element of 3ds Max is its ability to help supplement video footage for presentations, visual effects, film, still images, and motion graphics. Combining 3ds Max with After Effects, or software like Nuke, we composite existing elements, like drone video, with 3D elements in Max to prepare and present content in powerful ways. So let's review how the process works with 3ds Max and Adobe After Effects.

The first step is to prep the video. Start by clipping the video to the frames you want to focus on. Using After Effects, you can export the video using Adobe Media Encoder (installed separately) to the final resolution and proper codec. If you don't know

what resolution and codec you are working with, the High Quality 1080p HD preset option using the H.264 codec is relatively standard for most users' tasks. However, it's worth noting my iPhone is nearly reaching that resolution itself, and the standard is pushed higher constantly. It's becoming common to work with 4K resolution (sometimes higher) and res down when necessary in almost all media.

The next step is to export to an image sequence to use in 3ds Max. Select the drop-down and custom, then select Jpeg Sequence, as shown in Figure 1. Using the Adobe After Effects render queue, export the images using the Jpeg Sequence option next to the Output Module label. See Figure 1.

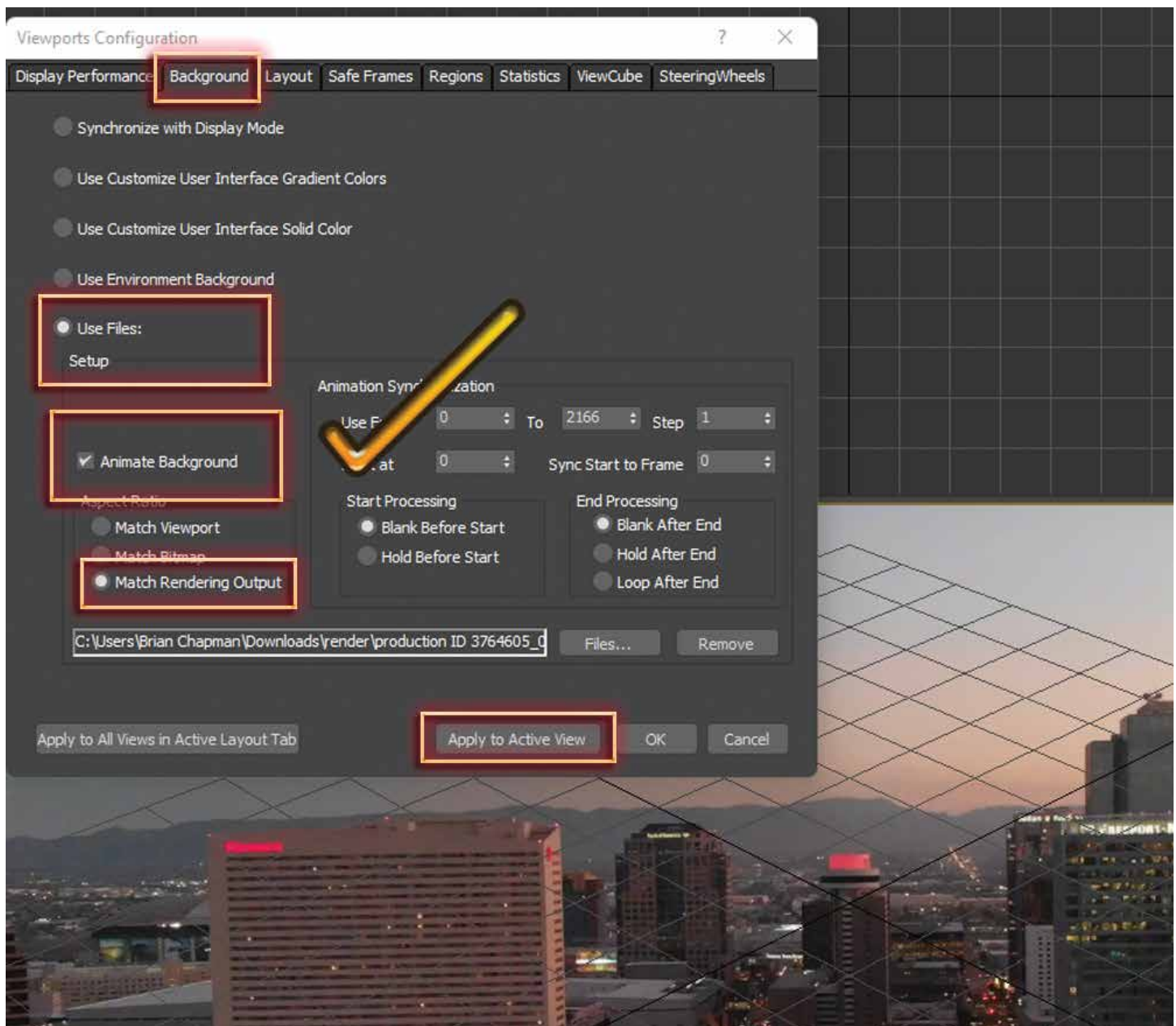


Figure 2

Now, in 3ds Max, add your content by activating the perspective viewport, then hold Alt and press B. On the Background menu, select the option displayed in Figure 2 to apply the sequence to your viewport. See Figure 2.

You should be able to press the play button and watch the sequence play in the background. If the sequence isn't playing, select Update Background While Playing in the preferences under the Viewport tab. Now, adjust your frame number to match your sequence and set the playback to real-time.

Back in Adobe After effects, start a new project and create a composition from sequence using the JPEG images initially exported. Using the Effects & Presets panel, search for and select 3D Camera Tracker. Drag and drop the item onto your composite and give Adobe a few minutes to calculate the results. That ensures we work with the same elements in After Effects and 3ds Max to avoid confusion or mistakes. After Effects also has more predictable results tracking from an image sequence than a video. See Figure 3.

You can see a frame-by-frame/percentage of the process complete on the effects control panel generally located on the top left. After that, a series of tracking nodes will appear in color. Tip: Choosing the detailed analysis option creates more accurate tracking and not much more time.

Select a few nodes representing the ground in 3ds Max, such as streets (avoid higher elements like building tops or bridges), click the right mouse button and select Create Null and Camera. Select roughly 20 and continue the same process.

Now, if you head over to the internet address here <https://aenhancers.com/viewtopic.php?f=3&t=991> you'll be able to download the script necessary to export to 3ds Max. See Figure 4.

In After Effects, select File -> Scripts -> Run Script File and select the script. Under the options, disable Add 4 Views for Maya and set the scale to 1:10 at first (this will vary per project, you'll need to experiment with it as you get more familiar with the workflow). Choose 3ds Max and assign a file name. The browse button doesn't work. It will save

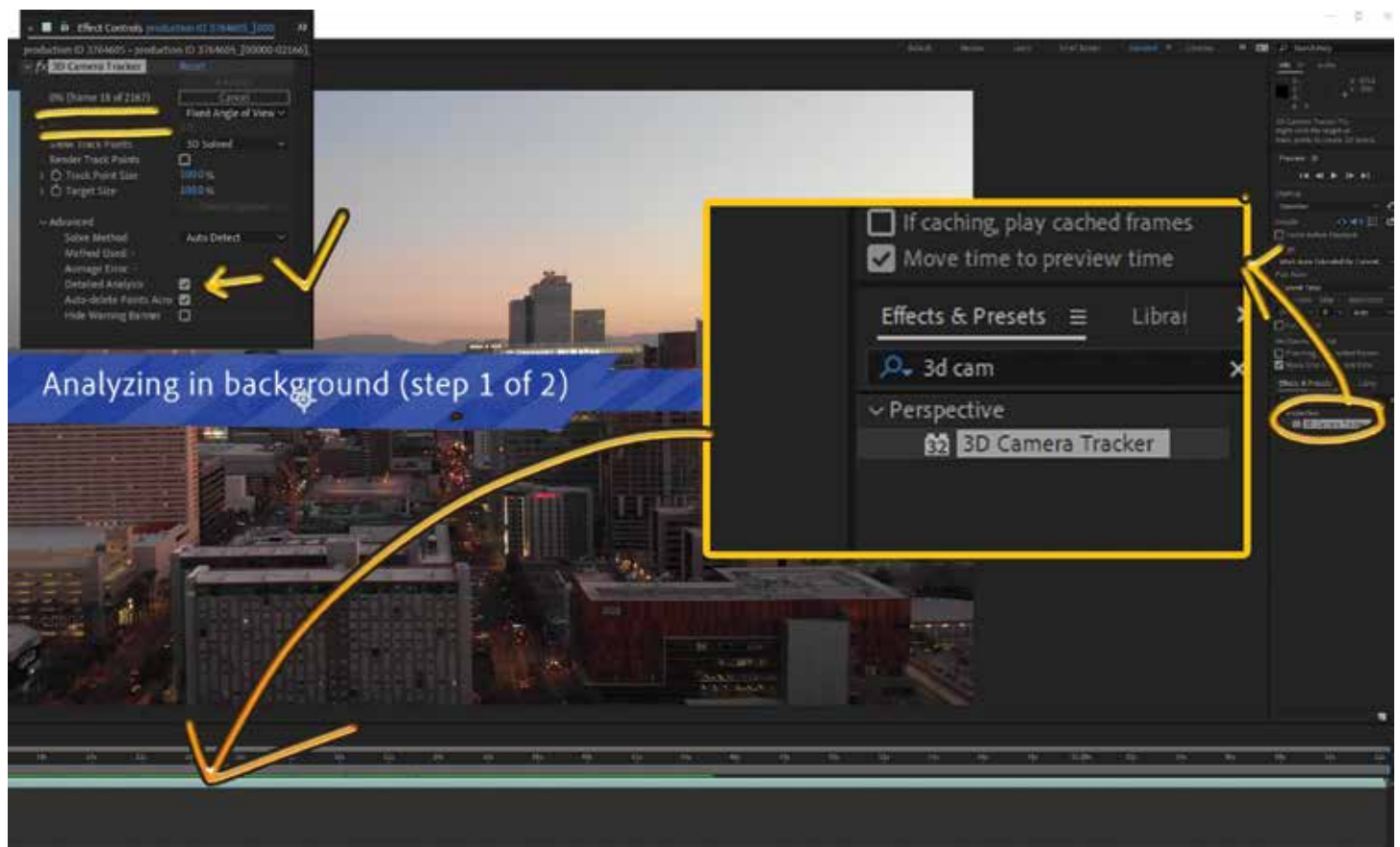


Figure 3

AE3D EXPORT - AE scene to Maya, Max, and Lightwave

Moderator: Paul Tiersley

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🕒 April 14th, 2008, 4:01 pm

AE3D EXPORT

This is a combination of the other export scripts I've posted lately, along with some new features. This one script is used to export the scene as a Lightwave file.

This script will export the scene as a Lightwave file, which can be used by Maya, 3ds Max, or Lightwave.



The script will export the scene as a Lightwave file, which can be used by Maya, 3ds Max, or Lightwave. The script will export the scene as a Lightwave file, which can be used by Maya, 3ds Max, or Lightwave.

<http://www.urbanspaceman.net/shared/AEs ... Export.jsx>

Figure 4

the final file to the desktop. Select the 3D Camera and all the tracking nodes, then press export, which will generate the Maxscript file necessary to generate the content in 3ds Max.

This concludes Part 1. Part 2 will follow next month. Stay tuned!



Brian Chapman is a 3D Artist located in Las Vegas building 3D content for the AEC industry, games, film, entertainment, and software development. Brian can be reached at pictelforge@gmail.com

What's in a Name?



AGA0201A.dwg = Drawing A on Sheet A02.01
AGAELEVA.dwg = Exterior Elevation A
AGAELEVA.dwg = Interior Elevation A
AGAFEQ01.dwg = Equipment Plan Level 1
AGAFIN01.dwg = Finish Plan Level 1
AGAFRL01.dwg = Floor Plan Level 1
AGAFUR01.dwg = Furniture Plan Level 1
AGARCP01.dwg = Reflected Ceiling Plan Level 1
AGASECBA.dwg = Building Section A
AGASECSA.dwg = Site Section A
AGASECWA.dwg = Wall Section A
AGASITE.dwg = Site Plan (see Figure 1).

LFN

Then Windows 95 was released and began to take over the tech world. The DOS filename limitations are now gone. The new Windows operating system supports LFN which stands for Long File Names. Files can be named with up to 255 characters. Both uppercase & lowercase letters along with special characters like spaces can now be used.

CHAOS

You would think with the new filename freedom, AutoCAD users would improve with an even better

(C:) > Windows

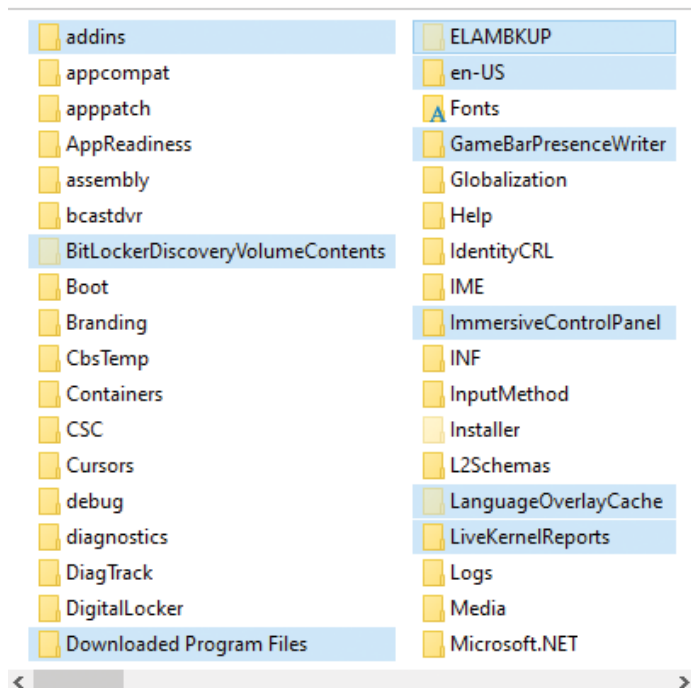


Figure 3

filename convention. But unfortunately, this is not the case. AutoCAD drawings now have **Files**, **Layers** and even **Blocks** named with an inconsistent mixture of spaces, underscores, dashes, uppercase and lowercase characters. Just like the Windows folder file listing (see figure 3), there are names that sometimes begin with an uppercase letter vs at other times would just be named using all lowercase letters. There would also be names with no spaces vs those with spaces. The inconsistency just goes on and on bringing chaos instead of order.

ORDER

To bring order to this chaos, I developed a couple of apps for AutoCAD: **LayerApps** & **BlockApps**. Since I already wrote extensively on LayerApps in the February issue, I'll focus on BlockApps in this article. Like LayerApps, which provides additional tools to manage Layer names, BlockApps provides additional tools to help manage Block names (see Figure 4).

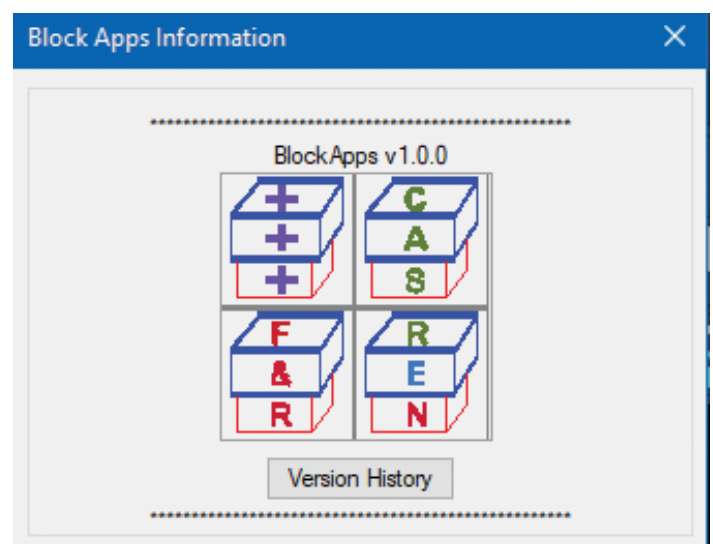


Figure 4

Note: Both LayerApps & BlockApps are free and can be downloaded from the Autodesk App Store.

DDBLKF&R

One of the new commands I added with BlockApps is called **DDBLKF&R**. DDBLKFR provides the AutoCAD user the capability to **Find** a set of characters in the Block name and **Replace** them with another set. So when you encounter in a drawing Blocks with some names using a dash "-" and others using a space " " DDBLKFR can be used to resolve this inconsistency. At the top of the

DDBLKF&R window are two edit boxes. In the **Find** edit box enter the “-” character and in the **Replace** edit box enter the space “ ” character. Next select under **Options** an operation like **All** which means to do a find and replace of all the characters in the Block name. Then in the body of the DDBLKF&R window select from the list of Block names to rename. The BEFORE vs AFTER images clearly demonstrate how simple it is to quickly replace all instances of “-” with the space “ ” character in all the Block names in the drawing (see Figure 5).

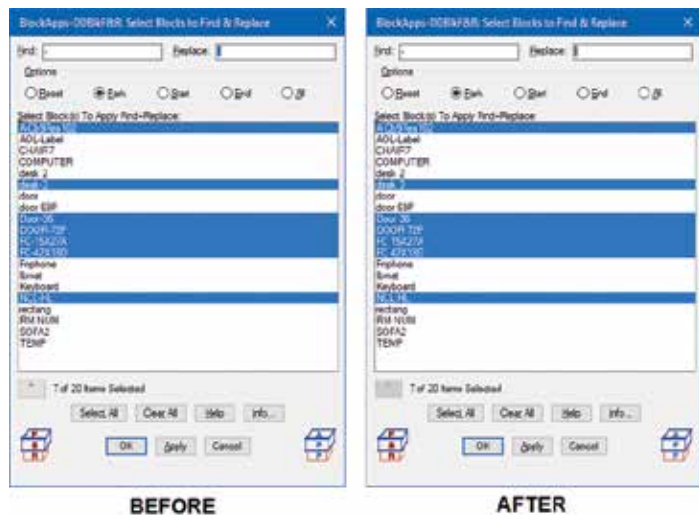


Figure 5

DDBLKCAS

Another new command BlockApps adds is called **DDBLKCAS**. DDBLKCAS offers a similar graphic user interface as DDBLKF&R. With DDBLKCAS you can

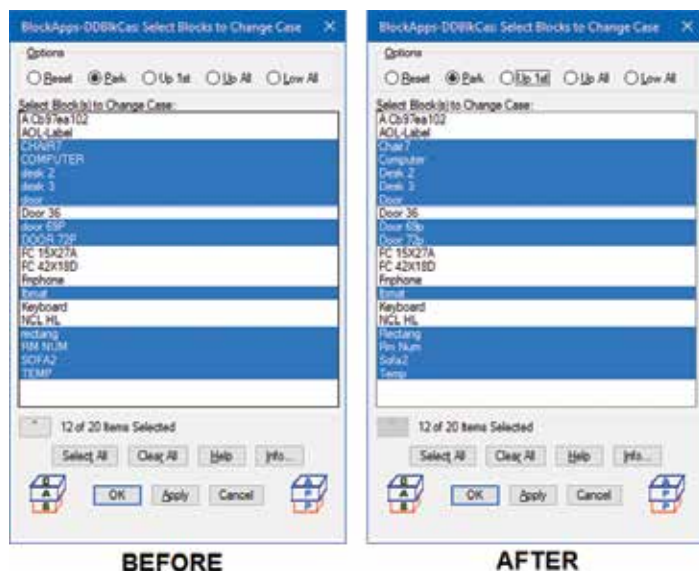


Figure 6

select Blocks that are named using a mixture of upper & lower case letters and change them all to be uppercase, lowercase or just with the first letter to uppercase (see Figure 6).

NOMENCLATURE

When a system of digital filenames are established logically, followed consistently and enforced properly this can only contribute to project efficiency. Then staff will have one less problem to deal with as they work on projects with one team vs another. Furthermore, a consistent filename convention makes working with AutoCAD that much more pleasant and enjoyable. After all I would be so confused if I walked into the office and was called Matthew on Monday, Mark on Tuesday, Luke on Wednesday, John on Thursday before finally being called by my given name Paul on Friday.



Mr. Paul Li graduated in 1988 from the University of Southern California with a Bachelor of Architecture degree. He worked in the Architectural field for small to midsize global firms for over 33 years. Throughout his tenure in Architecture he has mastered the use and customization of AutoCAD. Using AutoLISP/ Visual Lisp combined with Dialog Control Language (DCL) programming he has developed a number of Apps that enhance the effectiveness of AutoCAD in his profession. All the Apps actually came out of meeting challenging needs that occurred while he worked in the various offices. He has made all the Apps available for free and can be downloaded from the Autodesk App Store. Though he recently retired from the Architectural profession, Paul continues to write articles depicting his past work experience. Some of these articles can be found in AUGIWorld Magazine where he shares his knowledge learned. Paul can be reached for comments or questions at PaulLi_apa@hotmail.com.

What is Autodesk Innovyze Infoworks?

In February of 2021, Autodesk announced the acquisition of Innovyze, Inc for right around 1 BILLION dollars!!

Innovyze's modeling, simulation, and predictive analyses solutions enable more cost-effective and sustainably designed water distribution networks,

water collection systems, water and wastewater treatment plants, and flood protection systems.

These offerings can assist civil engineers, water utility companies, and water experts the ability to better respond to issues and to improve planning.

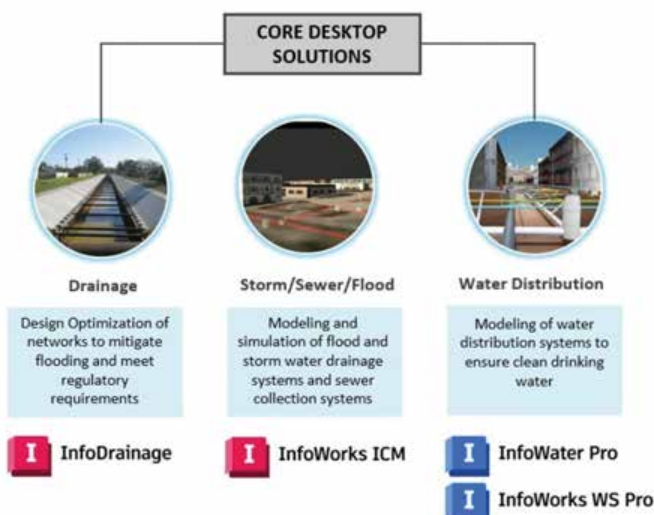


Innovyze's is trusted by approximately 3,000 customers worldwide. Why 1 billion for 3000 customers you may ask? Well, the customers include public and private utility companies in many of the most populous cities across five continents. These include a majority of ENR's top design firms, and leading environmental and engineering consultancies. These companies are typically large, so 3000 companies may be upwards of over a 30 million users, based on a stat I just made up!! But seriously, the user count is extremely large.

All the new Autodesk Info products support some level of import capabilities for Autodesk Civil 3D Storm, Sanitary, and Water Systems.

Let's hope for once that Autodesk changes the name soon! Because Inf-O-works and Infr-A-works is a bit hard to differentiate.

This group of products is so robust that we could write a book on each of the individual products,



but for now let's take a quick look at the Innovyze offerings, and how they can help.

INFOWORKS ICM

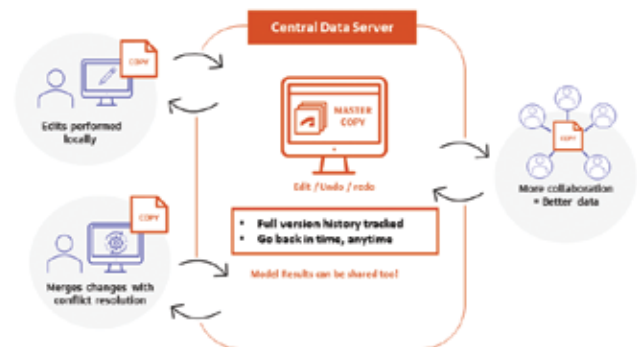
InfoWorks ICM is advanced integrated catchment modeling software created to model complex hydraulic and hydrologic network elements quickly, accurately, and collaboratively for stormwater and wastewater. This is used by small and large enterprises across the world to plan for capacity improvements, system expansions and emergency scenarios.

InfoWorks ICM has industry-leading capabilities such as:

- Fully integrated river, urban drainage, and overland flow modelling
- Conduct holistic hydrological and hydraulic assessments
- Facilitate project collaboration and team working
- Evolve to live modelling

The workgroup database in ICM allows users to maintain a complete history of their model, and along with an unlimited number of undo and redo actions hydraulic modelers will be able to quickly build a model, in-spite of errors that might occur during the process.

Workgroup Database



Data Inferencing

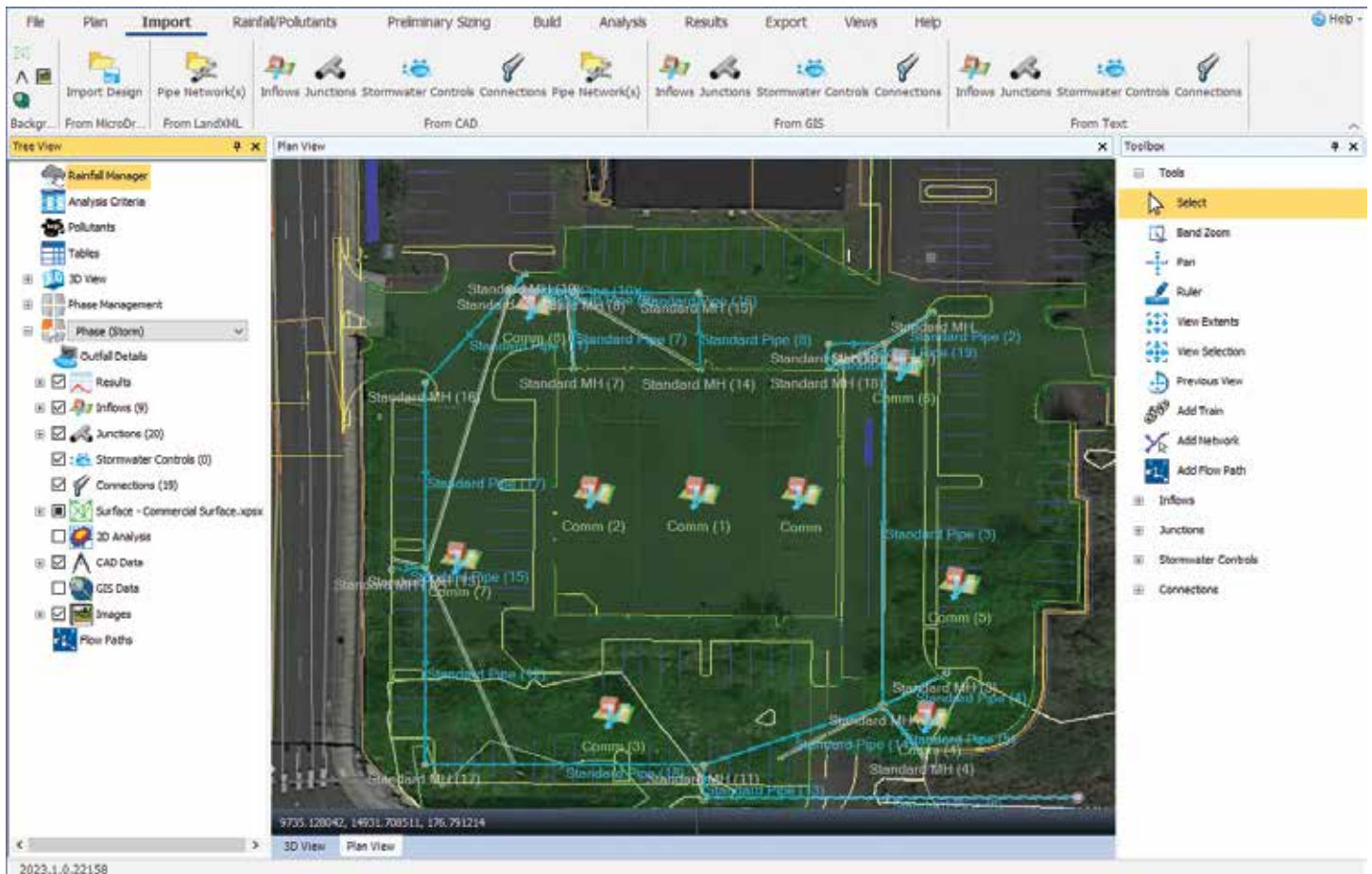
Survey data that is typically used to build hydraulic models may be missing certain elements that are necessary for the model to run accurately. This happens on almost all projects I've seen. Between GIS, as-builts, new survey data gathering and other sources or recreating the "As-Is" state of the system,

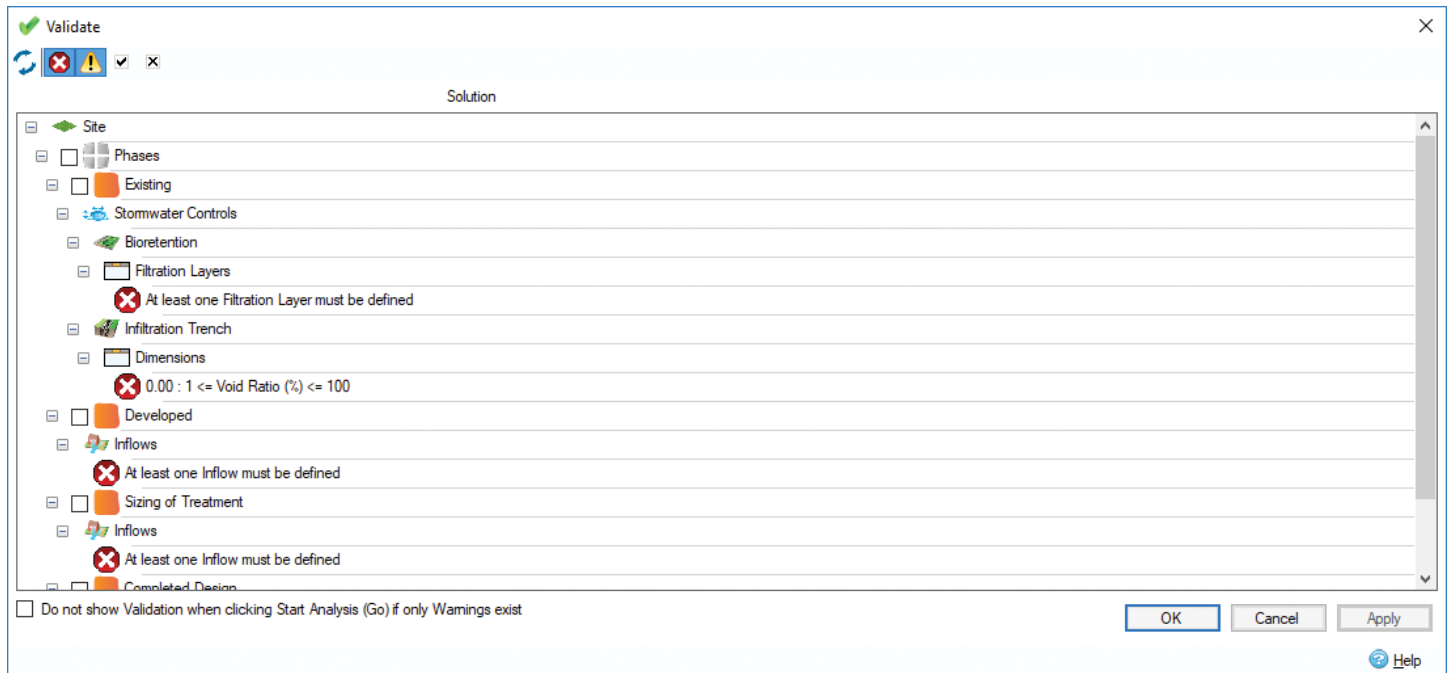


Runtime comparison for 2D Model

- 1000 acre area (350 ac inundated)
- 25 ft² Grid
- 7 day simulation

HEC-RAS 5.0.1	~12 hours	
HEC-RAS 5.0.5	~8 hours	
XPSWMM Classic	~6 hours	1 Core
XP w/ 2D EXTREME	~2 hours	4 Cores
XPSWMM GPU	~1 hour	Quadro M1000M
InfoWorks ICM GPU	~30 min	Quadro M1000M
ICM GPU Remote	~20 min	Quadro M4000





data is often missing. However, Infoworks ICM has built-in inferencing tools to fill in these gaps for things such as missing shapes and sizes of pipes or ground and cover levels.

These tools can be used quickly and easily to fill in data gaps, most commonly, found in survey data but also necessary to run the model accurately and efficiently.

Get reliable results, fast outputs are generated faster, meeting commitments, promoting reputation and allowing for more competitive bidding. Hydraulic simulations, depending on their complexity, can take hours or even days to complete. In addition to InfoWorks ICM's inherently **fast and accurate simulation engine**, simulations can be run on other servers or computers available in the network that are purpose built for running complex hydraulic models. Instead of relying on and consuming the hardware resources on a typical desktop computer, a high-powered server can be used by an entire organization to **provide much faster simulations**.

Simulate Flooding with Confidence

- Adapt 2D mesh to ground surface and surrounding GIS data
- Directly apply radar rainfall over catchments and 2D surface
- Detailed and efficient 1D-2D integration at points and banks

- Derive statistical flood damage over multiple recurrence intervals

Rainfall Generator

There is also a new Rainfall Generator that I thought was slick! The new NOAA ATLAS 14 Rainfall Generator can be used to download data from the NOAA's Precipitation Frequency Data Server (PFDS) to generate NOAA Atlas 14 precipitation frequency estimates for specified locations within the United States.

INFODRAINAGE

InfoDrainage is a full design and analysis solution used by designers, developers, engineers, consultants and approving authorities all around the world to design and audit drainage systems.

Data Formats

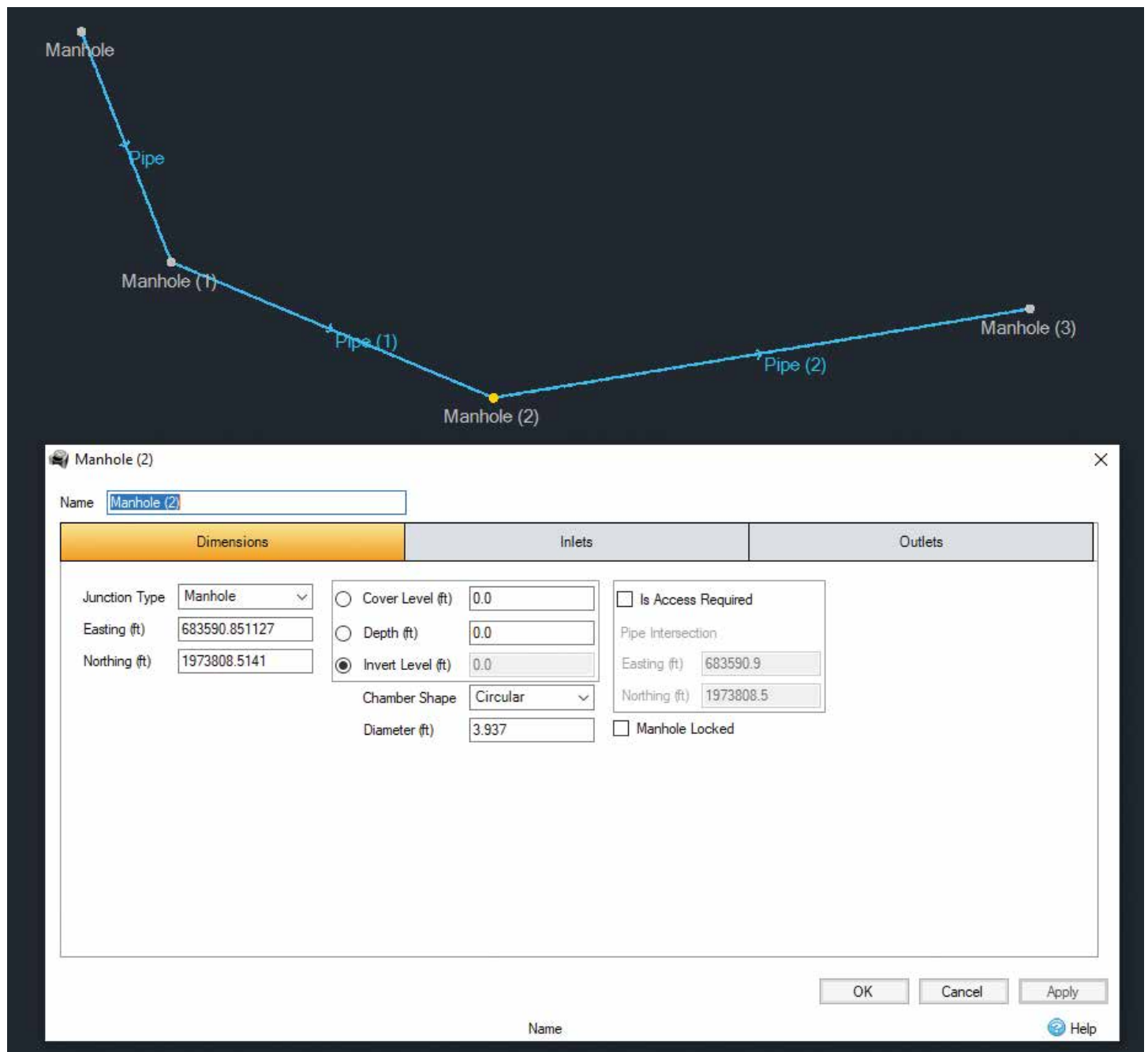
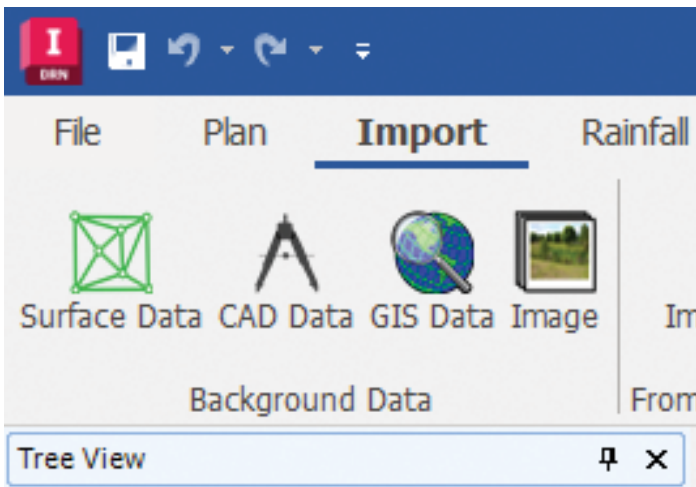
There are wide range of different data formats that can be imported to help create and update designs more quickly and efficiently.

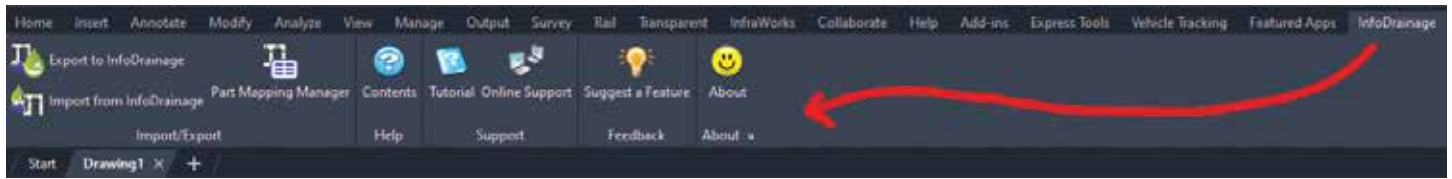
This allows the user to better utilize existing data available for a site and remove some manual workload and potential double handling of data. Being able to easily make use of existing data helps support a more streamlined design process, making the most of previous work completed in CAD or existing survey data for example.

Streamline Workflows to support your design process

You can create reusable template for structures across all object types, for example a Manhole or a Swale. Within the template you can specify everything from the basic dimensions of the structure to the definition of around the inlet and outlet conditions. Templates helps in removing some of the more labor-intensive tasks involved in the creation of standardized designs.

Having created a structure, you want to template you can quickly add it to your template library for





reuse. Once added you can then drag a template directly onto the plan, while preserving any pre-set dimensions allowing for the rapid digitization of your design.

And, built in validation is easy to run and identifies anomalies in your design, directing the user to potential problems and offering the user fixes which can be applied and updated at the click of the button.

Create and Modify Designs Directly on the Plan

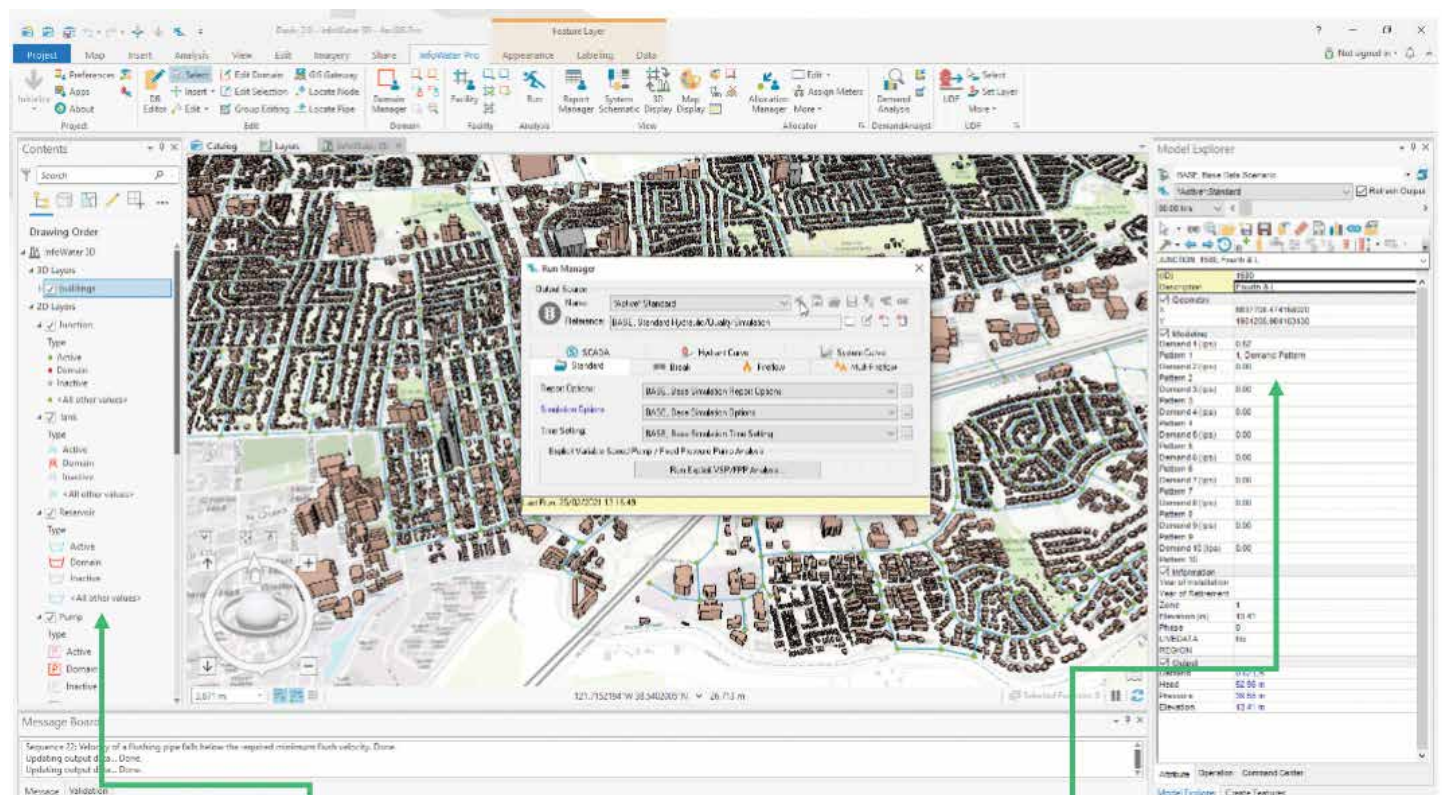
Quick graphical network creation helps to provide improved efficiency but also helps to ensure design suitability with other engineering disciplines, as our design can be true to site on plan.

All structures can be created graphically and by interacting directly with the plan.

Editing can be done in the same way as you work through your design, as you adjust your design, you will see just how easy it is to make changes and see results in real time.

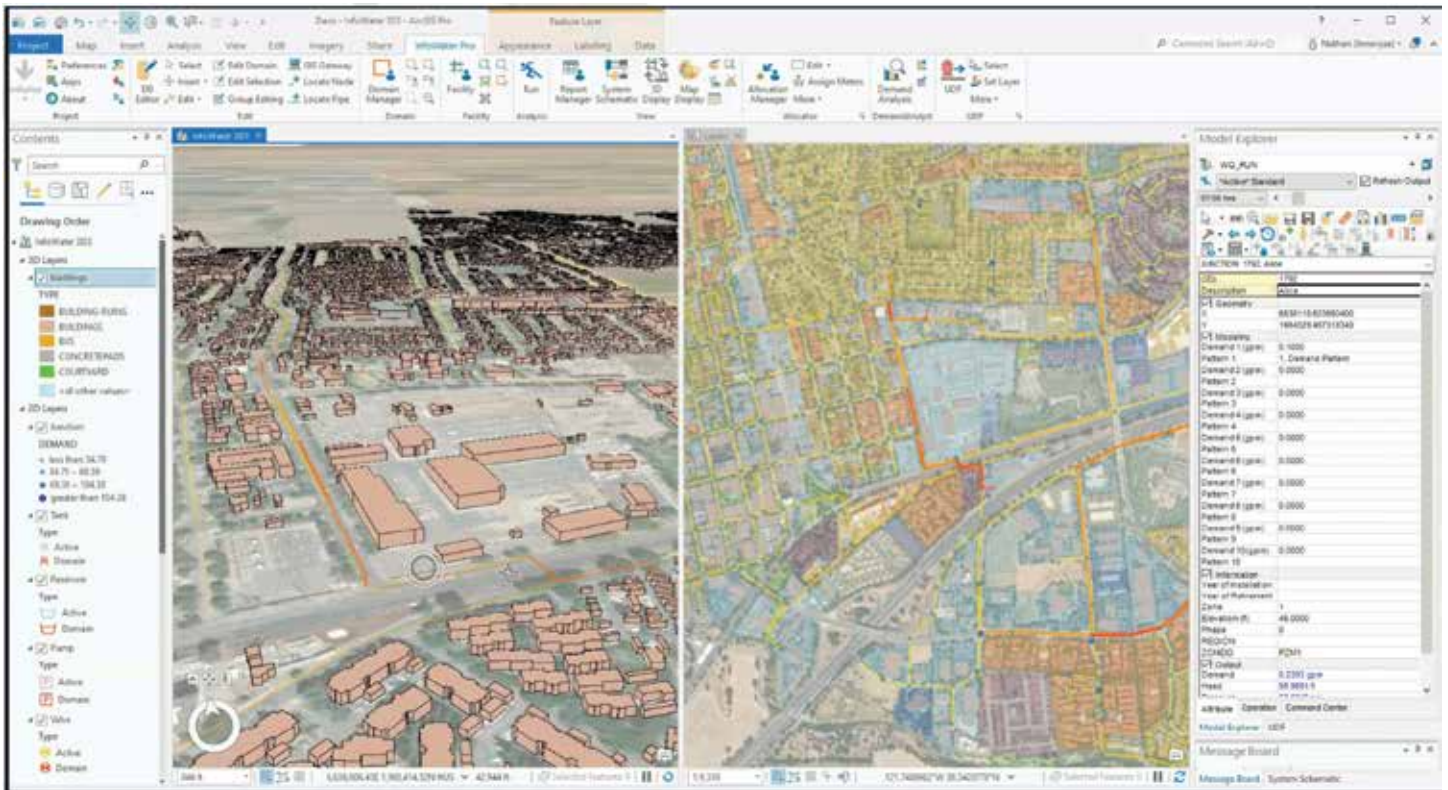
Phase Management Capabilities - Optioning and pre/post development comparison

Using the Phase Management capabilities, you can quickly replicate a base plan and then design and edit different approaches in parallel. This is great for giving engineers a tool that helps to support design creativity and an iterative design approach.



Modelling layers available

Model Explorer to look at modelling data



Pre v. Post development comparisons can also be quickly made using different design phases, allowing max inflow and outflow's to be identified and compared for instance.

Once you define a pre v. post site design and run an analysis on both, the results can be reviewed in detail in tabular form, with the ability to quickly pick out the key critical events.

You are then able to utilize the comparison report builder to create customized reports for easy reuse, the report builder allows you to define the report specifics and layout.

InfoDrainage – Direct Data Exchange with Civil 3D

The InfoDrainage integration with Civil 3D helps to streamline workflows and reduce manual data entry.

You can work directly within Civil 3D to create your design layout, which is typically where your data gathering, and design begins anyway. Utilizing the dedicated InfoDrainage Civil 3D ribbon you can initiate an export of your CAD data to InfoDrainage. The wizard guides the user through the simple export process.

From there, the design can be opened directly within InfoDrainage and the data can be reviewed in detail.

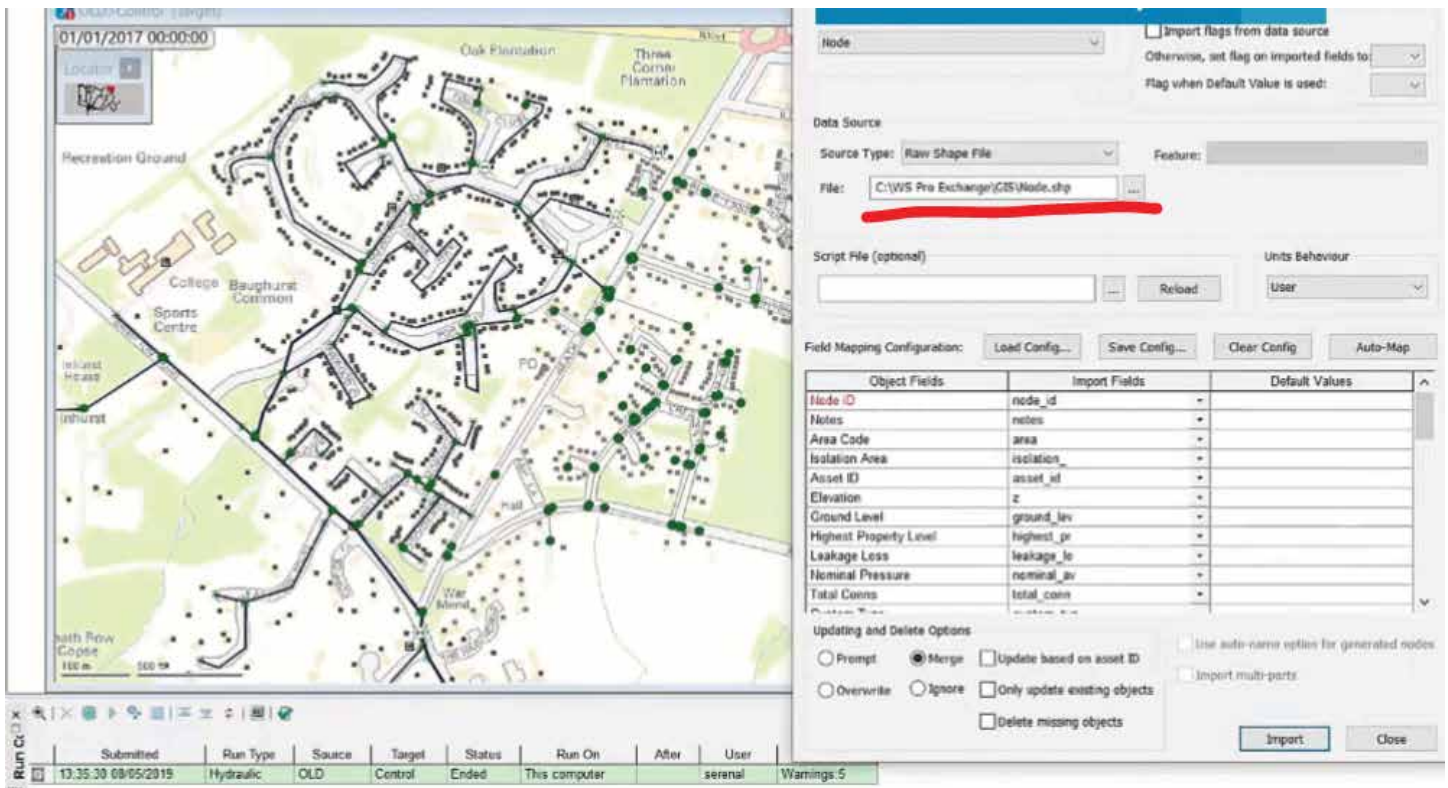
And now you can create catchments by exporting to InfoDrainage from Civil 3D, including the outline and properties of the catchment and connection to structures to minimize model setup time in InfoDrainage!

This data can then be brought back into Civil 3D via a similar import process. This round tripping of data gives you greater flexibility in terms of workflow and by using the parts mapping, this enables faster 3D object representation a key driver for BIM compliance.

INFOWATER PRO - ARCGIS PRO-BASED WATER DISTRIBUTION MODELING

Water distribution modeling enables engineers to represent their real water distribution network. With InfoWater you can:

- Plan for the short or long-term horizon, ensuring level services for growing population.
- Simulate the impact of any changes to the network (e.g., pipe break, new system extension (urban growth), different water demand (e.g., Covid impact on industries, businesses, and customers), etc.).



- Analyze water quality throughout the water system and ensure an optimum flushing strategy to remove debris and sediment and bring clean water to any customers no matter where on the network.
- Use a wide range of powerful analyses to minimize risks there is a burst, target and justify strategic and expensive mains rehabilitation schemes, overall aiding system resilience.

InfoWater Pro - A Brief Story

- InfoWater Pro is built in ArcGIS Pro, this means that those familiar with ArcGIS will be able to use the GIS tools to build and manage models easily, access various GIS-native layers, and visualize results and data in 2D and 3D for better understanding of the model. Finally, they can also easily share a view-only version of the model in ArcGIS Online.
- InfoWater Pro makes it easy to for modelers to understand system behavior and hydraulic performance, improving any recommendations made about designing or improving the water system.
- Modeling teams can trust InfoWater Pro results will represent the real water system, and quickly

see where any calibration issues might be. It improves the quality of the model, so they can rely on it to base infrastructure decisions

- These decisions improvements will be observed across a wide range of water projects, from planning and design to operation and maintenance.

Ability to visualize 3D and network models together

It is also possible to view element properties (e.g., elevations) and hydraulic results (e.g., pressure, total demands) in 3D display, to improve the understanding of what you are reviewing, whether node and pipes properties or results. When mapping element properties, it is also an effective way to visualize where input errors or missing properties might be located within the network.

You can view existing and proposed pressure zones. You can also study each zone's included hydraulic elements, for which you can review the minimum and maximum pressure, hydraulic grade line, water quality, flow, velocity, head loss, and hydraulic slope.

The schematic view of pressure zones enables users to quickly understand the interaction between different pressure zones.



And when you click a specific zone, you get the location of the zone on the network map, as well as a summary overview for the zone, so they can quickly see a performance overview of the zone.

INFOWATER WS PRO - COMPREHENSIVE WATER DISTRIBUTION MODELING

Engineers use InfoWater Pro software to model water distribution systems in an easy-to-use GIS interface.

- Leverage spatial analysis tools available in ArcGIS Pro to help with model building and management
- Run countless scenarios to simulate a wide range of simulations
- Present results clearly that you can share in ArcGIS Online

Extensive GIS Connectivity

- Exchange of data between the model and external GIS in multiple formats
- Web Mapping Service (WMS) support in addition to built-in MapXtreme or ArcGIS desktop/engine support

- Geolocation tools using online maps (e.g. Google Maps and Google Street view)

Connect Directly to Telemetry

- Direct connection to many types of telemetry databases including SQL Server, Oracle, PI, ClearSCADA, Info360
- Update boundary conditions and allow comparison of actual vs predicted values
- Leverage connection to telemetry to perform demand area analysis, roughness calibration, and leakage locator simulations

Mimic Asset Operations

- Explicit modeling of network assets (e.g., hydrants, meters, customer connections)
- Real-world modeling of pumps and valves operations (e.g., variable speed pumps, pressure regulating valves, etc.)
- Program the operation of pumps and valves according to state of sensors or conditions in network

Realistic Demands and System Behavior

- Realistic demand modeling – including pressure-related demand, drain down and recharge
- Customer-centric: comprehensive service-level reporting at customer connection

The reason for building and updating a model is to reproduce what is happening in the real system. So, it is crucial to simulate complex system behavior as closely as possible, which includes realistic pump and valve operations, water demands, and other system behavior such as the drain down and recharge of a tank which is approximated in other water modeling products. Because operations can be simulated accurately, operation engineers can trust the model to guide their decisions.

INFO360 ASSET & INSIGHT

Info360 Asset & Insight are cloud bases (Saas) solution from Innovyze. Here is just a little info about what each one does.

What is Info360 Insight?

Experience designed workflows that let you quickly identify incidents in your system, check multiple resolution scenarios, and apply recommended actions to rapidly resolve system failures.

What is Info360 Asset?

Info360 Asset is a cloud-based application that empowers asset practitioners at utilities and municipalities to centrally:

- Better manage costly inspection data and media
- Use historical and current condition data to monitor and assess condition and performance of their assets
- Build and use models of likelihood of failure (LoF) and consequence of failure (CoF) for renewal prioritization planning

Info360 Asset helps asset management practitioners review, store, and manage all inspection data effectively, assess condition

conveniently, determine risks accurately, and guide renewal decisions—all from a single cloud-based platform. It also provides nontechnical stakeholders with an easy-to-understand web environment they can access, so they understand maintenance and renewal decisions.



Shawn has been a part of the design engineering community for roughly 15 years in all aspects of design, construction and software implementations. He has implemented and trained companies across the Country on Civil 3D and other infrastructure tools and their best practice workflows. Shawn can be reached for comments or questions at sherring@prosoftnet.com.

Asking for More Staff



Some of you work alone and others have staff under you to help with supporting tech. Being a Tech Manager means you oversee technology efforts and hopefully staff. Both of these areas of oversight are important. Overseeing technology started on day one, but overseeing staff may not be something that your firm has expanded into yet. Or you may have staff but need more. The job is just too big to get done on your own. Having staff who report to you and help with tech oversight is a great benefit. If you have help, be thankful. If you have no one who is paid to help you, or you have too few people helping you, then this article is for you.

YOU NEED HELP

When you have too much to get done and it is impacting projects it is time to ask for staff. It is overwhelming when you think of all the things you have to get done. It is tiring, just thinking about it. When it is just you, it can be very daunting. You need help. You need more people. Projects are being impacted. You are overworked. When you have a team and the team has too much to get done and it is impacting projects, you need to ask for more staff. Either way, you need help.

So how do you build a good case for getting more staff to help with CAD/BIM/Tech? Oh, that was just as easy as asking. Everyone should know how swamped you are. They should understand your trials, toils and travails. This should be a no-brainer. Just ask and they will give you more people.

You do need to ask, but you can't just waltz into the boss's office and ask for another team member... "One does not simply walk into Mordor." You need some data to back up the request and some planning on presenting it. You need to do your homework. You need to build a case for the productivity and progress that can be made with a larger team. Try some of the things that I have done in the past to help me get more staff.

DEFINE WHAT YOU WOULD DELEGATE

If you had another person to help out, what would they do? I covered delegation in the last few articles and even if you have no one to give things to... keep track of what you would give them *if* you had someone. I know one of the questions would be "What would the new person do?" You need to

be ready to answer that question with a good list of things that could be done by someone else. Be ready with a list.

KEEP TRACK OF HOURS SPENT

When discussing staff tasks you may hear a statement, "Those things don't take that long to do." You need to follow up your delegated task list with the time it takes to get the things done. This is a must. Don't let others define the timeline that you have to live with. Make sure they know the actual time it takes for the tasks you plan for a new employee. They add up quick. Don't forget the daily, weekly, or monthly repetitive tasks that must be done that few seldom know about because they are less obvious to others.

DEFINE WHAT YOU WOULD DO IF YOU HAD TIME

The two-part conversation above is usually followed by, "Aren't you doing that now, why do we need someone else?" The Answer: "Because it chews up a lot of my time." Then you can rattle off the things you would be able to do if you had the time. Paint a picture of the innovation that could be achieved. Tell them about the new tech you might be able to introduce. Don't make promises but do let them know the possibilities.

KEEP TRACK OF HOURS SPENT

You may not really keep track of how long it takes to get things done. You just keep plodding along and things come and go, and you may not remember how long it takes for some tasks. Start writing them down. Write down the start and stop times as you do them. Don't forget to include the time it takes to break off what you are doing and starting up something else. Planning time is needed also, no matter how brief. Include that. Documentation after the job is done takes time too (you are doing that – right?). Include that also. You will soon start seeing where all your time goes.

KEEP TRACK OF OVERTIME AND CHARGE FOR IT

You have to come up with 40 hours per week that is needed to sustain a full-time employee. If you are working beyond the 40 that is shown on the

books, track it. Don't forget to add those hours that you put in by starting early, working through lunch and staying late. And the best thing to do is to charge for them. If you are non-exempt, make sure you are compensated. If you are exempt, you may not be paid but you need to make those hours visible to others. You may have to send an early email (to timestamp when you are working) or send one right before you head out the door 45 minutes after quitting time. Don't forget the weekend emails that you reply to. Or the longer hours you or others put in to get the tech back online and working. Don't leave those hours hidden. If you have a team, the collective hours can be pooled to get 40 or more. It is critical that other see those hours, because you need to use that data to say, "We are working enough additional hours to justify another full-time employee."

KEEP TRACK OF WHAT IS BEING DELAYED

Another topic you may want to bring up are initiatives that are being delayed because of the lack of sufficient staffing. Things are taking longer. Your backlog is growing. Things languish for the need of extra hands to help. You may have projects that are not being done or strategic plans that are not coming to fruition. This discussion is a delicate balance, don't make it seem like you are unable to do your job or prioritize. Keep it positive and show your desire to tackle these tasks, but you just need more help. One way to do this is to ask your boss which is more important, project 1 or project 2, because being shorthanded may cause delays in one of them. Then she knows what is on your list, that you can do them both, but that staffing constraints is causing delays.

MAKE A STAFFING PLAN

Know what position you want to hire and what the duties are. Have a job description draft ready. Plan for expanding your staff and in what order. Write it down. Always remind your boss that you have a plan and know what is needed next. Add the justification to the plan. Write up a paragraph on each position that you need (if you need multiple people) and why you need it. Update it as new initiatives come to mind. Keep him informed.

MAKE YOUR CASE

Is the company increasingly profitable? Are they expanding? Taking on new projects? Then it is time to ask for more staff. Ask casually and formally. Set a meeting with your boss to discuss workload and staffing. Talk about what the current situation is, don't complain. Tell them that you are managing it well, but it is getting tougher each day. Let them know what the benefit is of hiring. Then, depending on the flow of the conversation, ask if you can hire now or soon. Don't be too demanding and don't be too soft. You need to ask, politely, "Now? If not now, when might it be possible?"

KEEP ASKING

Ask regularly for more staff. If you get a no, then take it as "not now". Go back every so often and ask again. Do it more informally for a while, then make a formal request after a period of months. Situations change all the time, and you may be able to make some headway. Is the company hiring in other departments? Ask again. Did the company just land a major new project? Ask again.

With skill, luck and perseverance, you can land a new staff person and see the results. It is worth the effort, and it strengthens your team and firm.



Mark Kiker has more than 30 years of hands-on experience with technology. He is fully versed in every area of management from deployment planning, installation, and configuration to training and strategic planning. As an internationally known speaker and writer, he is a returning speaker at

Autodesk University since 1996. Mark is currently serving as Chief Technology Officer for SIATech, a non-profit public charter high school focused on dropout recovery. He maintains two web sites, www.caddmanager.com and www.bimmanager.com. He can be reached at mark.kiker@augi.com and would love to hear your questions, comments and perspectives.

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21st Annual AUGI Salary Survey

20 years ago, AUGI ran the first survey of its members, providing real-world data specific to our industry.

Please keep an eye out for email blasts, social media channel updates and the forums next summer so you can participate, too!

We appreciate those members who were able to take the time to participate in this year's survey. If you are reading this and do not remember seeing the emails with the survey link and salary content, please be sure to go to augi.com/account to ensure your email address is current. If you need help accessing your account, reach out to membership@augi.com. Then check augi.com/account/email-subscriptions to ensure 'Bulletins' is checked 'Yes'.

As always, when members take the survey, they are asked to reply with the details from their most recent fulltime role, and to indicate any job changes such as layoffs or furloughs in later questions.

The first question people have with regard to our salaries, is always the differences in Cost of Living in various areas. Metropolitan areas and rural areas can be costly or affordable no matter the location, so be sure to check additional resources for those variances. For example, according to the ETC Salary Calculator, an Architectural Drafter with an Associate's degree and 6-10 years of experience could make a median of \$58,000 a year in Tennessee, and \$67,000 a year in the New York City metro area.

I am a big fan of wwwIndeed.com/Salary, the ETC Salary Calculator, Glassdoor, as well as industry-specific surveys from other professional organizations. The salaries reported here (in US dollars, as participants were given a link to a currency convertor) reflect salary and bonuses for those who work 40 hours a week, and are calculated to exclude overtime pay.

Ten years ago, only 15% of our members were able to telecommute, but that is up to nearly 55% today.

In 2020, 20% of us were hit with a reduction in wages or benefits, but this year, only 4% were. Wages increased across the board, but those in Rural areas saw the smallest increases.

59% of companies increased staff, vs only 35% in 2020. 36% of people that year did not receive a wage increase, vs 21% this year.

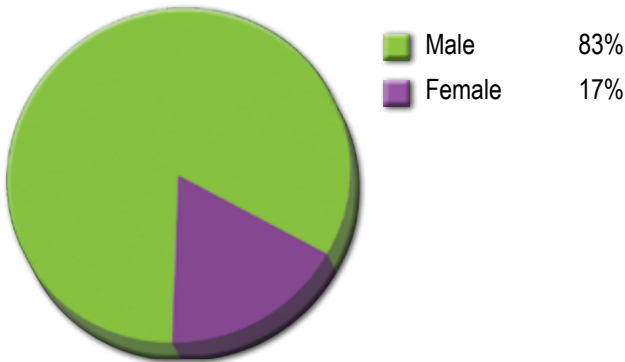
63% of respondents report that supply chain issues have impacted their business this year.

Designer remains our most common job title, so we have one page specifically addressing that role.

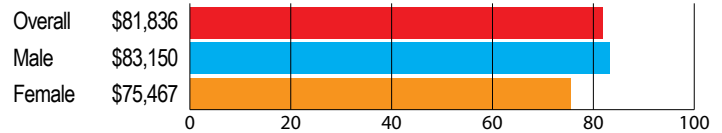
Please enjoy examining the factors that impact wages, and remember to come back next year to take part.

DEMOGRAPHICS

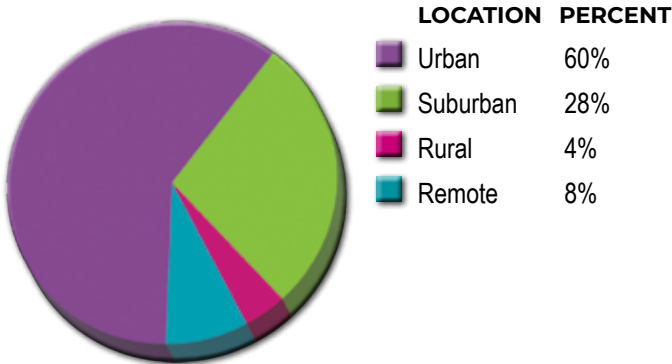
Employee Gender



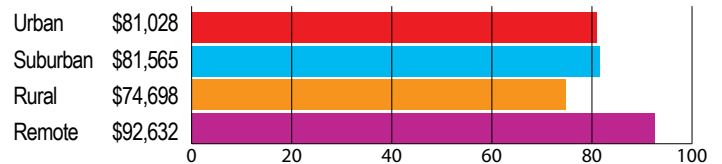
Average Pay



Work Location



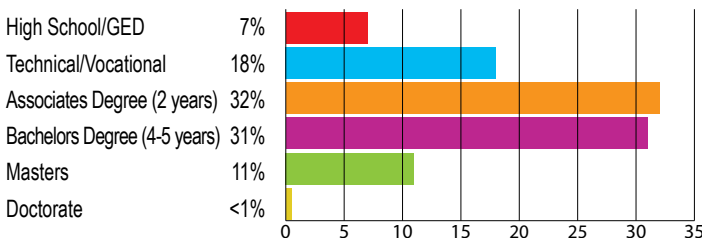
Pay by Work Location



Those working in Urban areas have decreased 10% since COVID.

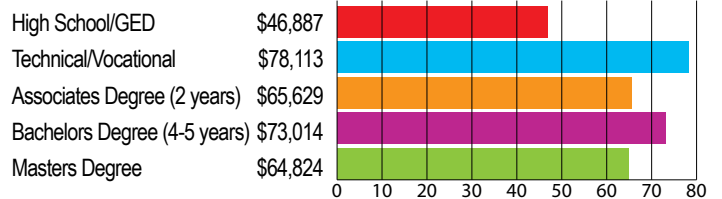
Those who work remotely 100% of the time have quadrupled in the same timespan.

Education Level/Degree Attained

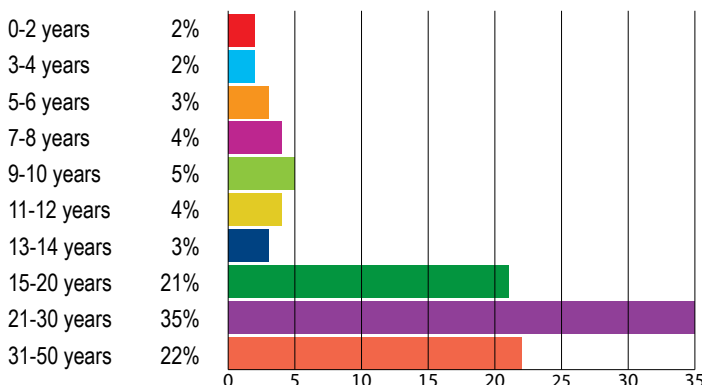


Average Pay by Education Level

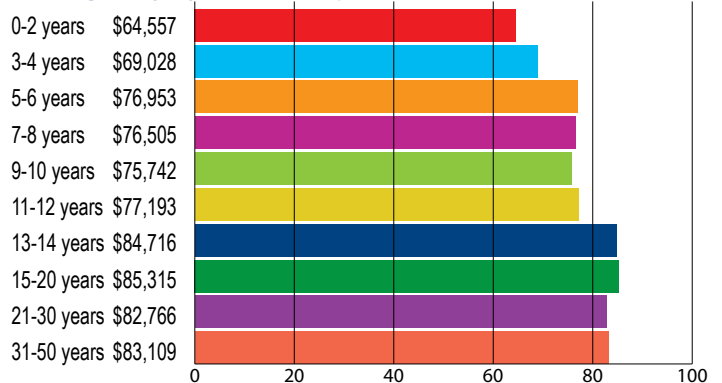
(for those with 5 or fewer years of experience)



Respondents' Years of Experience



Average Pay by Years of Experience



Check out these resources for additional information on pay:

Indeed.com/salary
Salary.com
Payscale.com

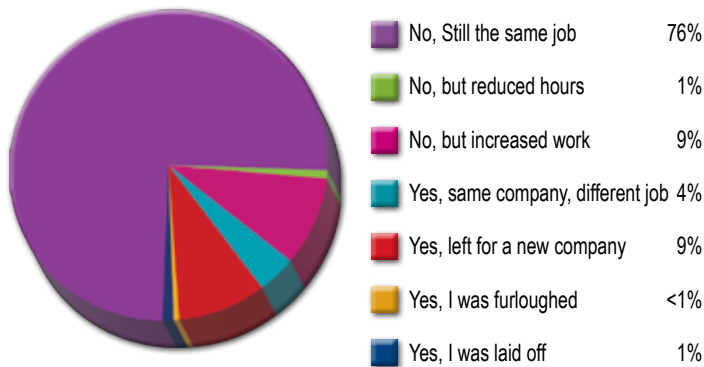
ETC Salary Calculator
Glassdoor

Search for other professional organizations related to your market, or administrative services like TriNet, to get more niche data.

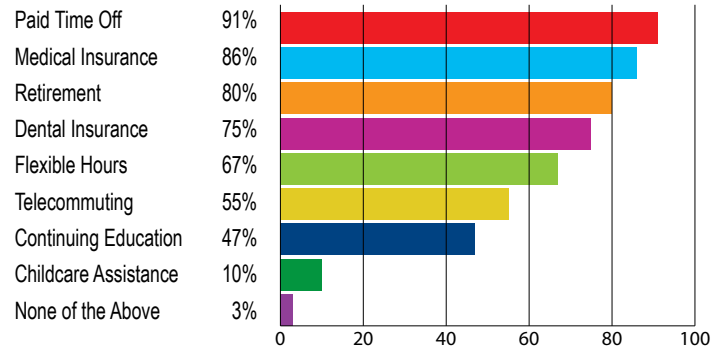
Work life balance seems to be improving, continuing last year's decrease in those saying they are not available after hours.

COMPANY DATA

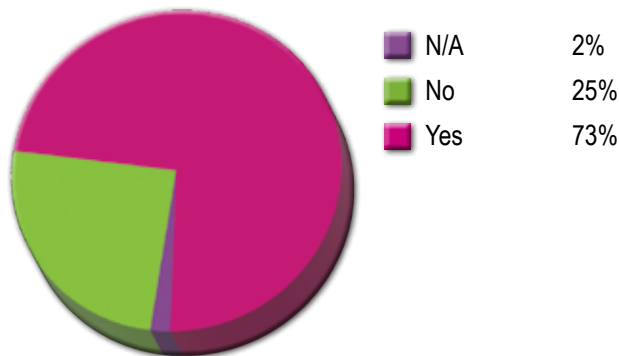
Change in Employment?



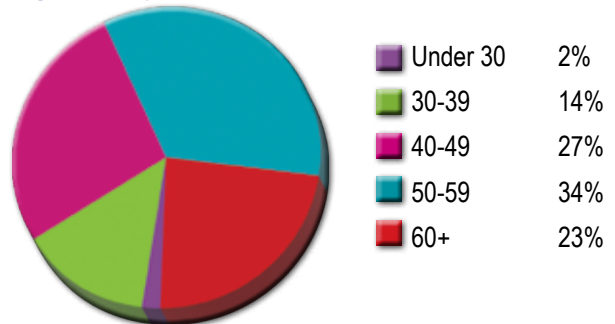
What Benefits Are Available to You?



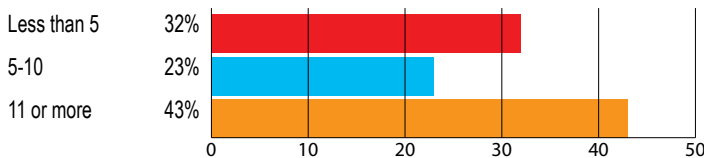
Does Your Company Have a Human Resources Department?



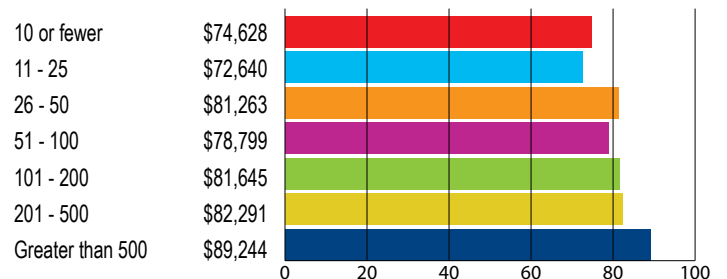
Age of Respondents



How Many Years Have You Worked for Your Current Employer?

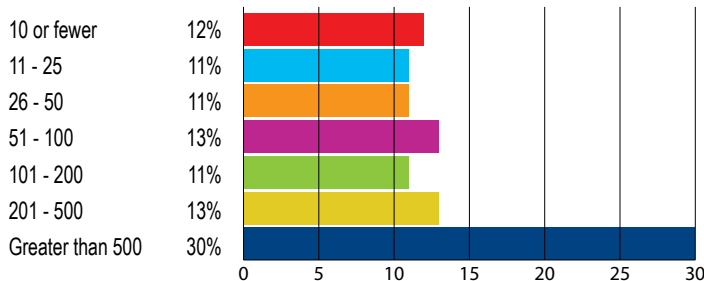


Average Pay by Company Size (Number of Employees)

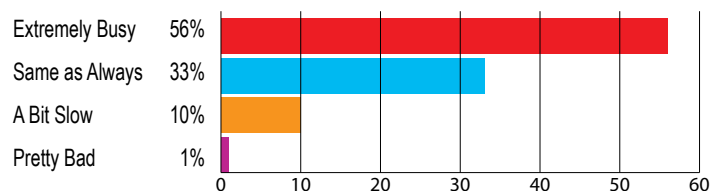


When this survey began, only 7% of employers offered childcare assistance.

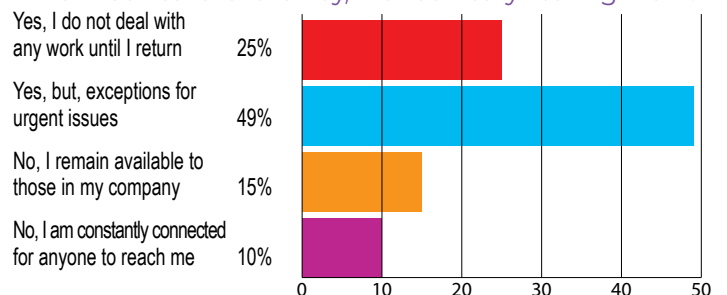
Number of Employees in Company



Current Workload



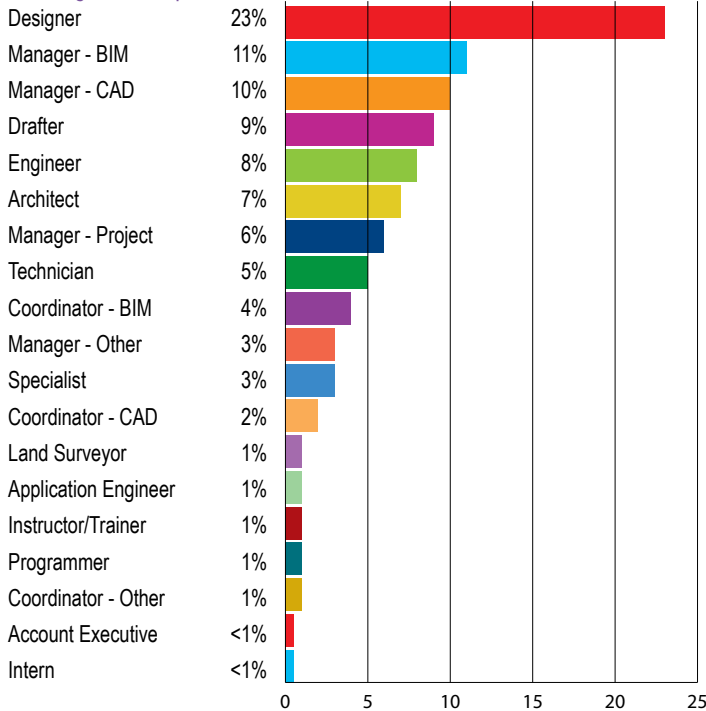
When You Leave for the Day, Are You Really Leaving Work?



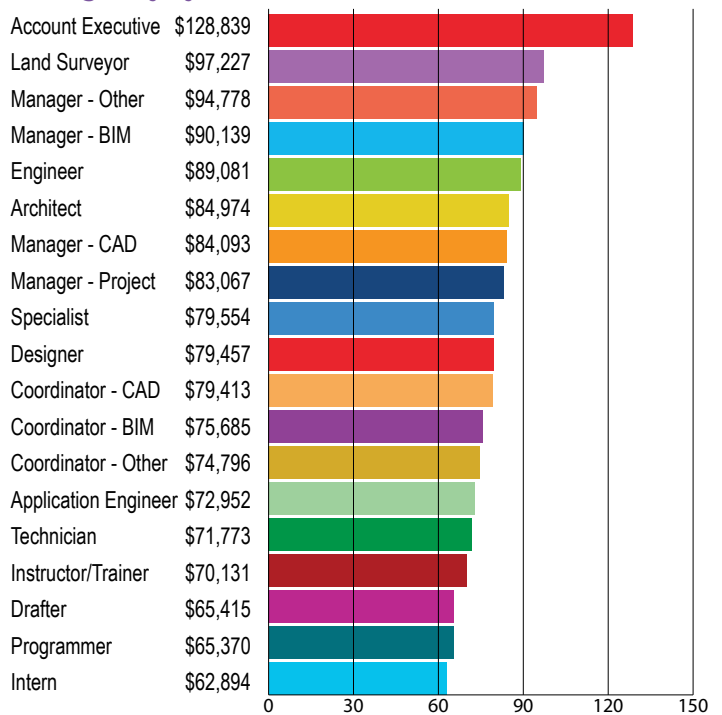
The ability to telecommute has further increased to 55%. That is a big jump over the 15% who reported this benefit a decade ago. But, let's face it, for many design and engineering roles, it could be higher.

JOB TITLES

Survey Participants

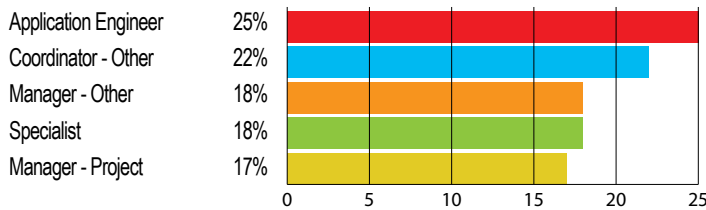


Average Pay by Job Title



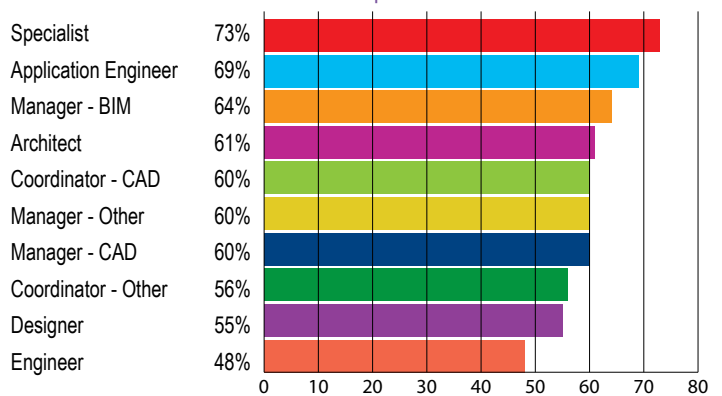
Jobs with the Highest Mobility

(percentage of each title who reported being in a new role this year)



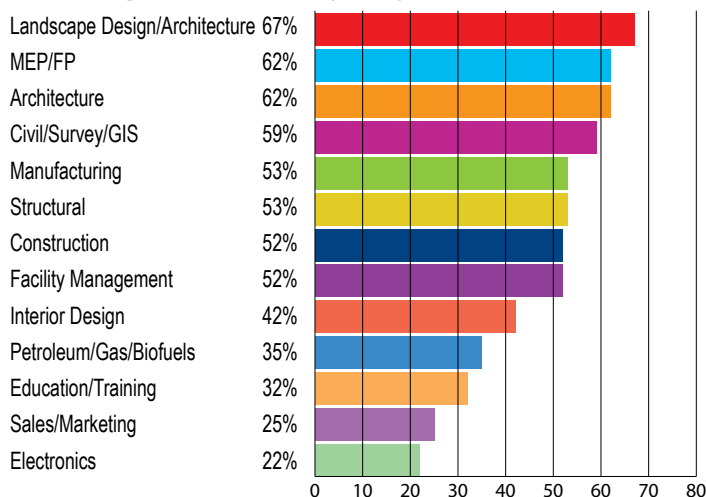
Those with slow workloads decreased from 14% to 11%

% of Each Job Who Has the Option to Telecommute

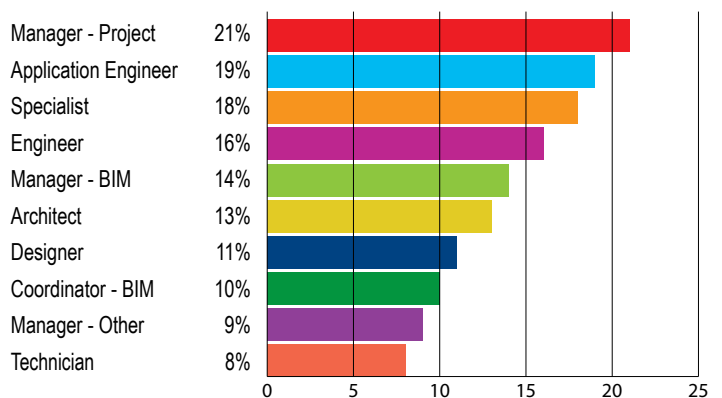


Reminder: All reported average pay is based upon a 40 hour workweek. It would include potential bonuses, but, is calculated to exclude overtime pay.

Percentage with Extremely Busy Workload

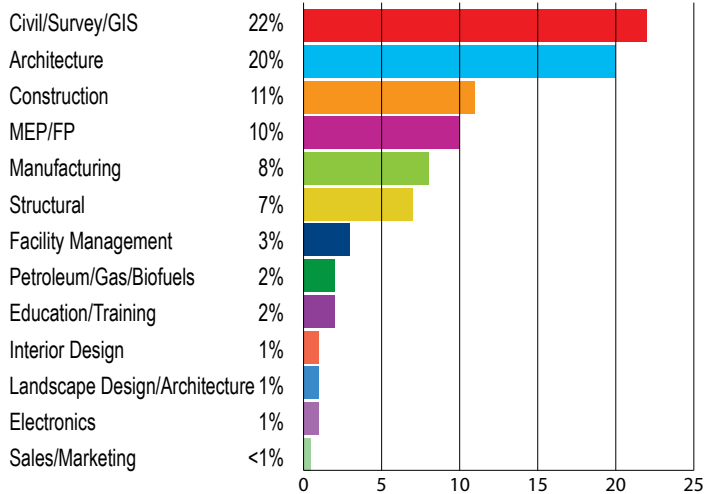


% of Jobs Who Received a Raise Greater than 10%

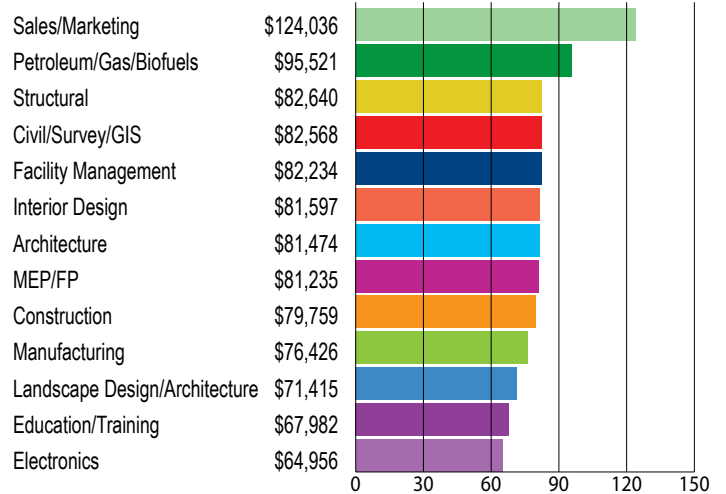


INDUSTRY/DISCIPLINE

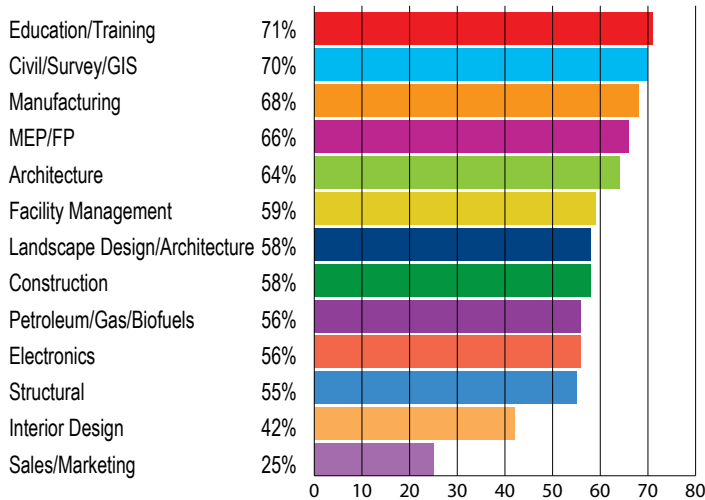
Survey Participants



Average Pay by Field/Industry

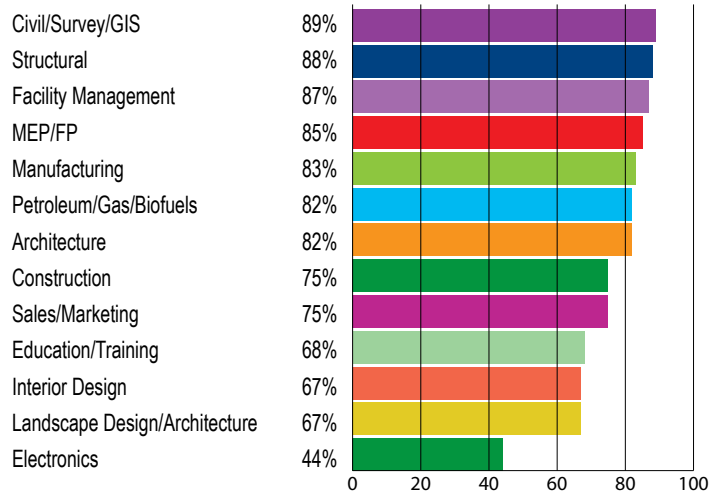


Percentage Experiencing Staffing Issues*



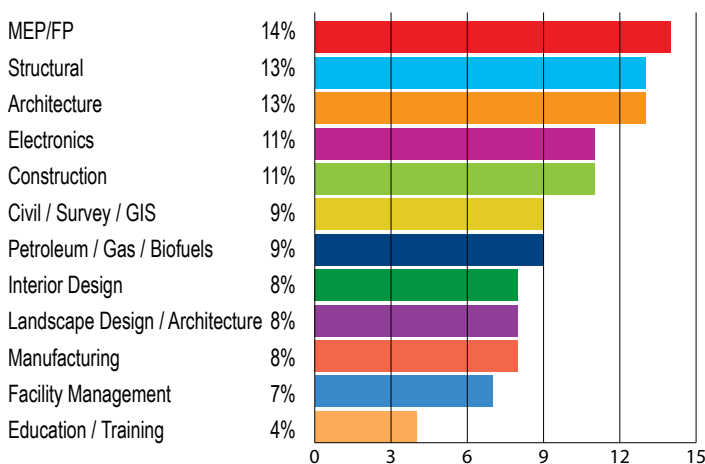
*For details on the type of staffing issues these companies are experiencing, please see our Hot Topics page.

Percentage of each industry feeling Secure in their jobs

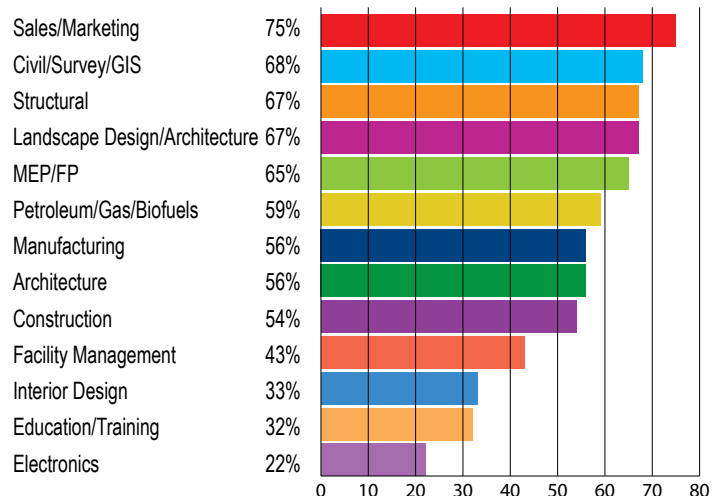


For only the second year in our history, Civil is leading in industry participation rates!

% of each industry who received greater than a 10% raise

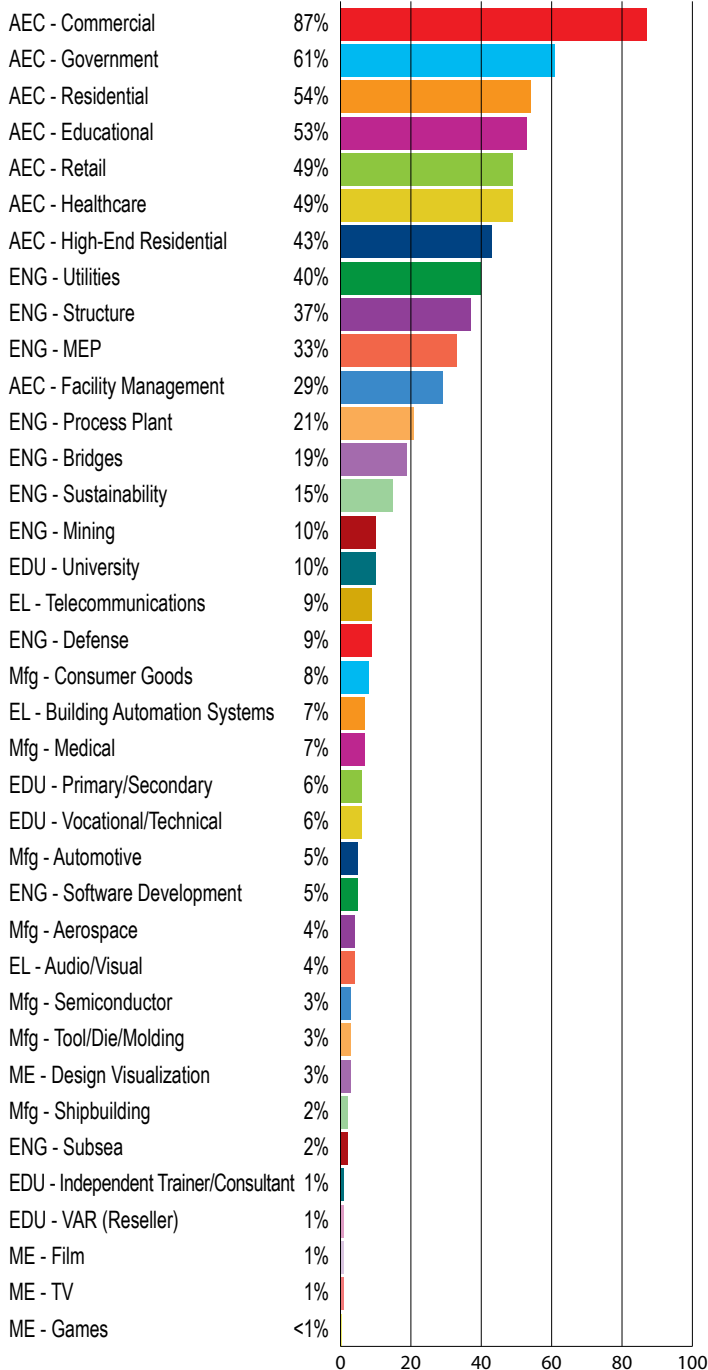


Percentage of Each Industry Reporting Staffing Increases

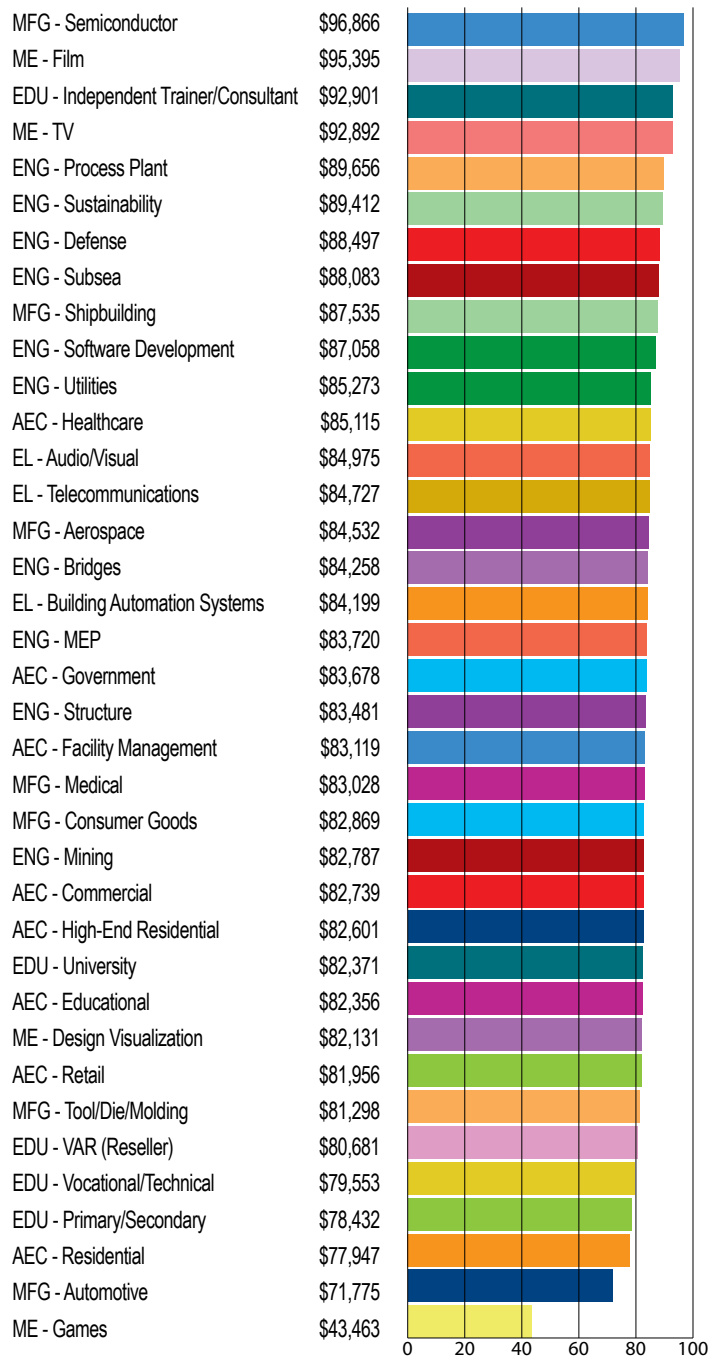


MARKETS SERVED - INDUSTRY SPECIALTIES

Size of Market Segments

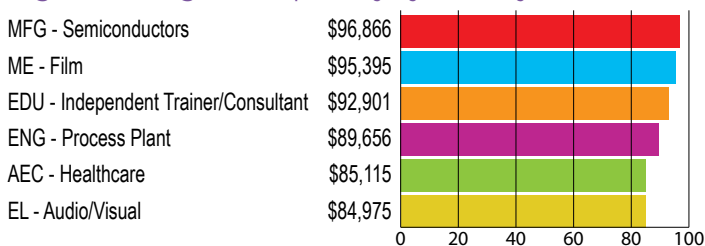


Average Pay of Market Segments

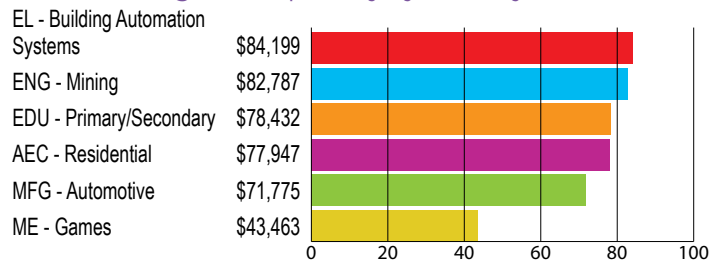


Between 50-82% of every market specialty in this list reports having issues staffing adequately over the past year.

Highest Average Paid Specialty by Industry

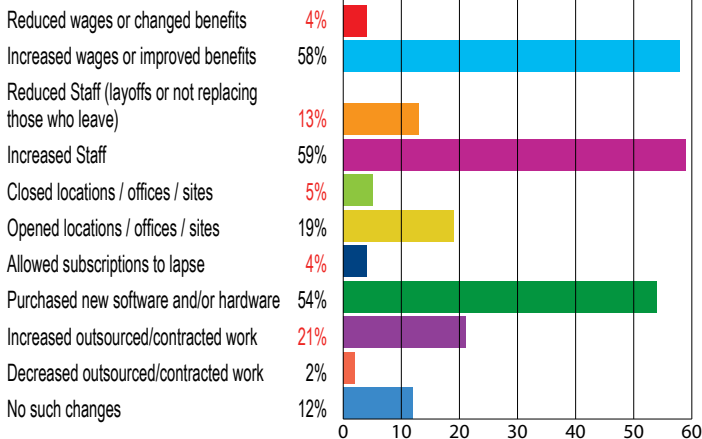


Lowest Average Paid Specialty by Industry

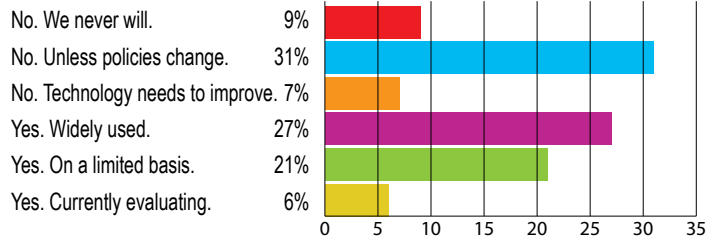


HOT TOPICS

Has Your Company Done Any of the Following in the Past Year?

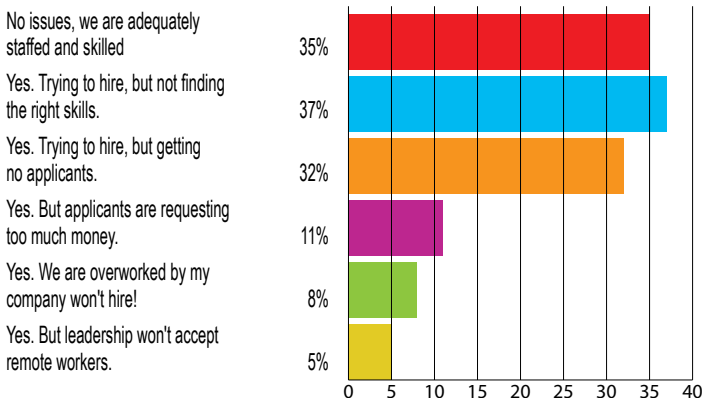


Do you use CAD/BIM in Cloud?

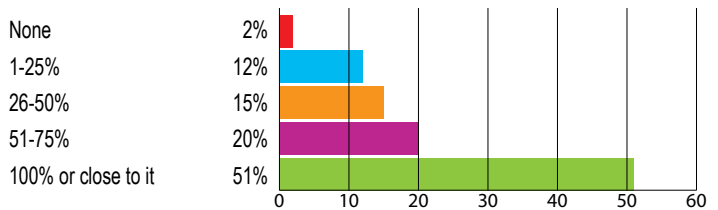


"No" responses on cloud usage have fallen from 83% in 2013, to 47% currently.

Has your company experienced staffing issues this year?

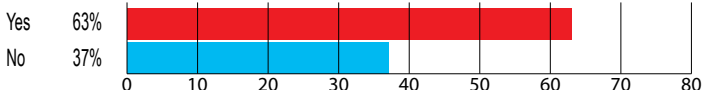


How much of your company is back in the office now?



The Conference Board, a nonprofit researcher of business trends, revealed the results of a survey in April. Showing that only 4% of companies were requiring all of their employees to return to the workplace fulltime. 90% were allowing hybrid working.

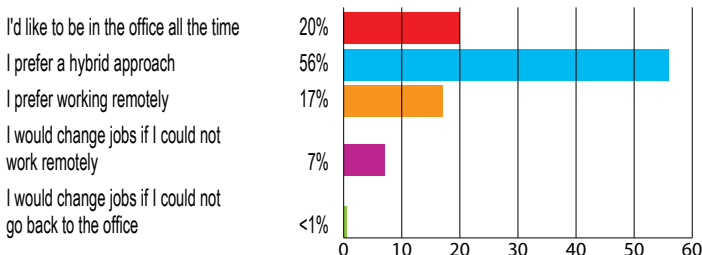
Have Supply Chain Issues Impacted Your Work This Year?



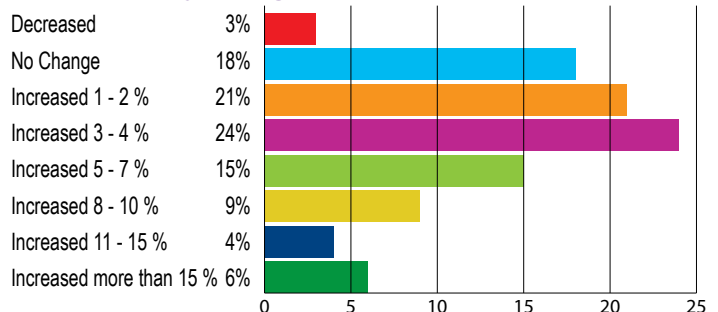
Compared to 2020:

Wage reductions dropped from 20% to 12%
Wage increases improved from 32% to 44%
Staff reductions decreased from 36% to 27%
Staff increases improved from 35% to 49%

What are your feelings on remote work?

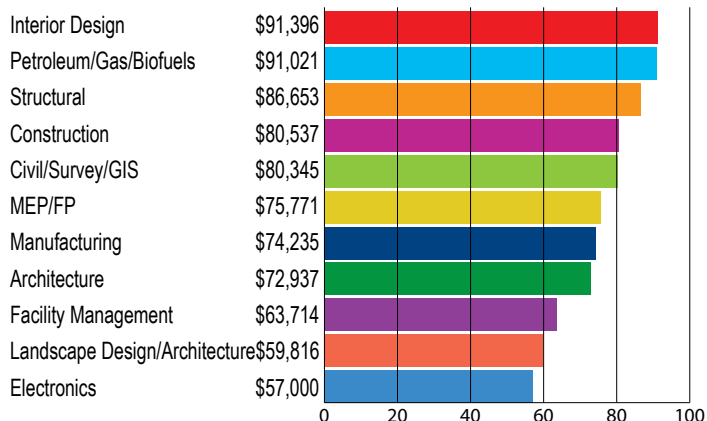


Has Your Salary Changed in the Past Year?

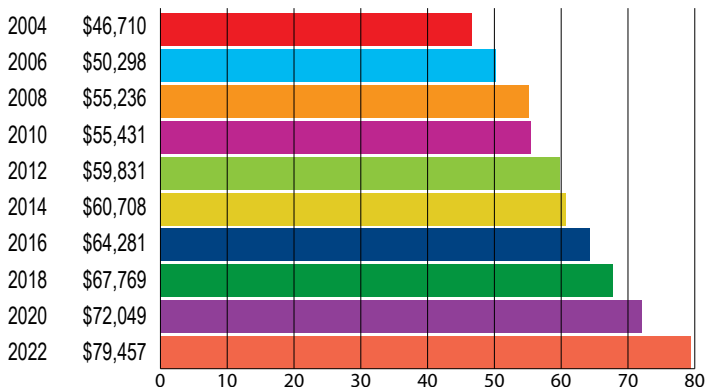


DESIGNER CLOSE-UP

Average AUGI Designer Salary by Industry



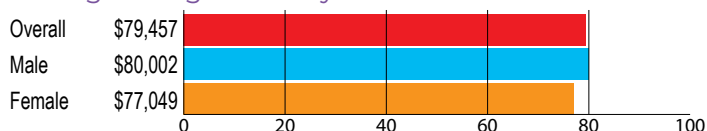
Historical Average Designer Pay



Average Age of Designers is 51.

55% of Designers report the ability to telecommute.

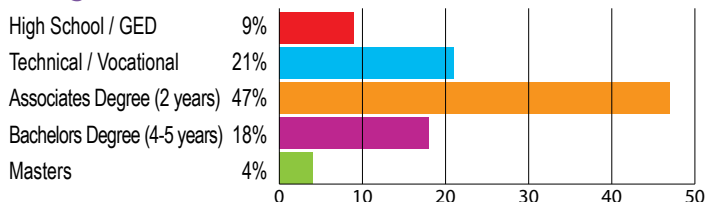
Average Designer Salary



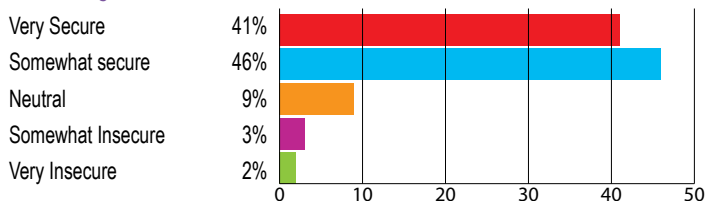
Have 25 years of experience in the industry.

12 years working for their current company.

Designer Education Levels



How would you describe your feelings of job security?



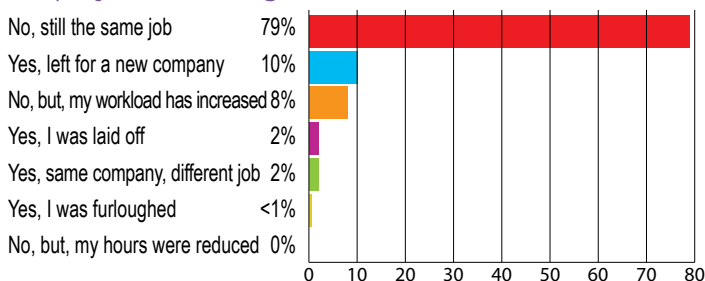
55% of Designers rate their workload as Extremely Busy, almost 30% more than 2020

70% of Designers can work flexible hours.

86% of designers feel Secure in their jobs.

5% of Designers feel insecure in their jobs, vs 12% in 2020.

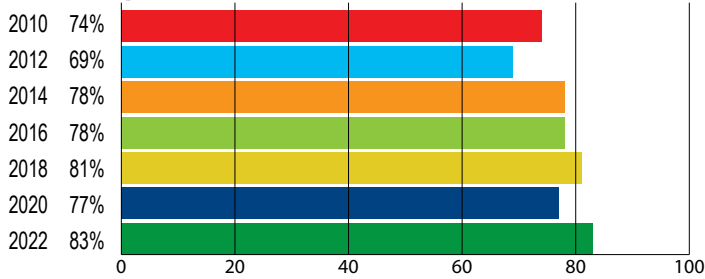
Employment Change in the Past Year



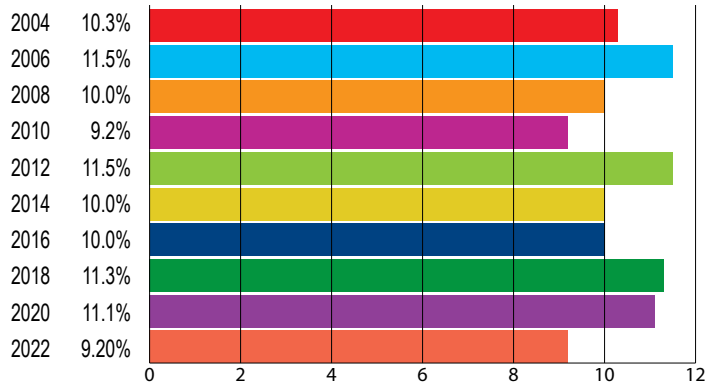
83% of designers received a pay increase in past in the past year.

A LOOK BACK

Percentage of Users Who Feel Secure

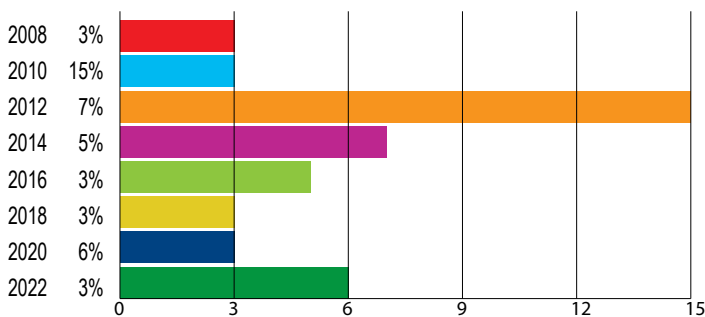


Percentage of Gender Pay Difference*



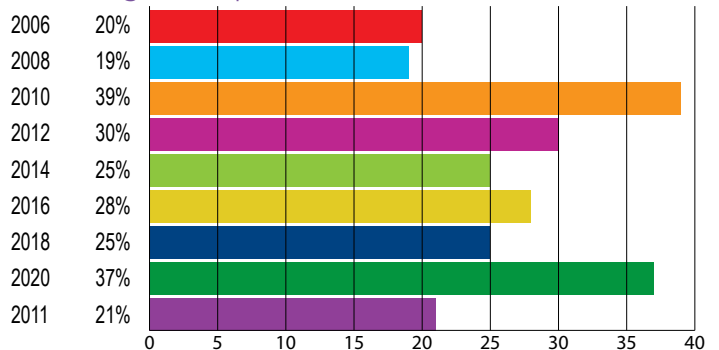
* These numbers reflect a 40 hour workweek

Percent Who Experienced a Pay Decrease

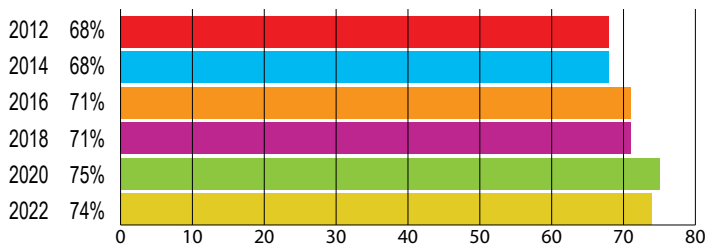


While the percentage of Designers has remained steady over the years, the volume of members with the title of Drafter has shrunk from 28% in 2002 to less than 9% today.

Percentage of Respondents Who Received No Raise



Percent of Users Who Are Satisfied



FUN FACT: The AUGI Salary Survey first ran in 2002 and was initially published every January.

In order to shift the publication date, so that it would fall prior to end of year performance reviews, two surveys were published in 2008. Which is why this article's headline describes 2022 as the 21st Annual Survey.

The U.S. Bureau of Labor Statistics' Occupational Outlook Handbook

Describes many jobs in our industry, and reports on how many workers are in those jobs as well as the median earnings and projected outlook:

<https://www.bls.gov/ooh/architecture-and-engineering/home.htm>

Architects, for example, are predicted to grow 3% more jobs over the next decade, which is not much. There will still be a lot of hiring, through, thanks to retirement and moves to different occupations.

Drafters are predicted to shrink a further 2%.

Mechanical Engineers are predicted to grow 7% more jobs, with over 20,000 job openings per year.



Melanie Stone is an IWMS Application Engineer working with R.O.I. Consulting Group. She served as an AUGI Director/Officer for over 6 years, and is currently involved with the STLRUG. Melanie can be reached at mstone@roicg.com or found on Twitter as @MistresDorkness



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DUES: \$2/month or \$20/year



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Welcome to *AUGI*WORLD Inside Track! Check out the latest opportunities to advance your skills, processes, and workflows in your firm with the most current AEC-related software and hardware updates available.

Here's another Inside Track for you. It's a bit of a 'pick and mix' for you this month, including AutoCAD, Civil 3D and Revit. For those of you not from the UK, 'pick and mix' was a stall in a department store, where you filled a bag with lots of mixed sweets (candy). A happy memory from my youth.

Here are this month's picked and mixed opportunities to advance your skills, processes, and workflows with the most current AEC-related software and hardware updates available.



NBS (FOR REVIT)

<https://apps.autodesk.com/RVT/en/Detail/Index?id=7531922127528702691&appLang=en&os=Win64>

Autodesk Revit

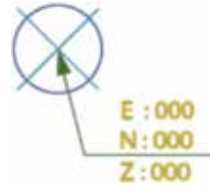
Version: 2023, 2022, 2021, 2020

A free tool to browse thousands of consistent and high-quality BIM objects from the award-winning NBS National BIM Library whilst working within Revit. Using the unique NBS plug-in you can drag and drop selected objects directly into your model. All objects are authored to the NBS BIM Object Standard, ensuring consistency and currency of the hundreds of generic and thousands of manufacturer objects within the library.

Typical workflows: -

1. Adding content to your project.
2. Checking you are using the latest available content.
3. Coordinating your model and specification.

The NBS is a superb source of BIM and Revit content. Utilize their expansive library to enhance your projects.



SA-LABEL (FOR AUTOCAD AND CIVIL 3D)

https://apps.autodesk.com/ACD/en/Detail/Index?id=64313300092039860&appLang=en&os=Win32_64

Autodesk AutoCAD

Version: 2023, 2022, 2021, 2020, 2019, 2018

Autodesk® Civil 3D®

Version: 2023, 2022, 2021, 2020, 2019, 2018

This free program can write the coordinates with a leader in East-North-Elevation in the form of a set of points or by clicking on the screen. Simply run the command and choose the appropriate layer and text height, then select the points.

A good one for that moment when you need those co-ords in the drawing!



LIDAR TOOLS (FOR CIVIL 3D)

<https://apps.autodesk.com/CIV3D/en/Detail/Index?id=7757132332424513672&appLang=en&os=Win64>

Autodesk® Civil 3D®

Version: 2023, 2022, 2021, 2020, 2019, 2018

A useful collection of tools to make it easier to work with Lidar files in Autodesk® Civil 3D®.

The primary tool (**LidarTin**) creates a Civil 3D TinSurface directly from multiple LAS/LAZ files while allowing the use of classes like (2 = Ground) to filter out irrelevant points. A good collection of companion tools helps in managing and pre-processing Lidar files.

Lidar is becoming the norm for surveying with today's technology. A good one to have in the toolbox!



PROSHEETS - BATCH EXPORT TO PDF, DWG, IFC, ETC. (FOR REVIT)

<https://apps.autodesk.com/RVT/en/Detail/Index?id=8920075109543819118&appLang=en&os=Win64>

Autodesk Revit

Version: 2023, 2022, 2021, 2020, 2019, 2018

ProSheets is a free plugin for Autodesk® Revit® that allows users to bulk export views/sheets to PDF, DWG, DGN, DWF, NWC, IFC, and IMG (e.g., JPEG, PNG, TIFF, etc).

Main features:

- batch export Views and Sheets to PDF, DWG, DGN, DWF, NWC, IFC, and Images (JPEG, PNG, TIFF, etc).

- Auto-detection of the paper size
- Auto-detection of the paper orientation
- Auto-generation of custom paper sizes
- Advanced naming rules (using sheet parameters, project information parameters, custom fields, etc.) - E.g., <sheetName>-<SheetNumber>.pdf
- Ability to store your favorite settings in a profile.

Notes:

This add-in will automatically install the PDF24 and a custom 'diroots.prosheets' virtual printer. Uninstalling them will make ProSheets stop working.

Another great Revit plugin for Revit from DiRoots. Batch exporting is often a must. This plugin helps!

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



AUGIWorld brings you recent developments in Autodesk and related software items

MAKE DESIGN DECISIONS IN

~~MONTHS~~
~~WEEKS~~
~~DAYS~~

MINUTES



Beyond Typical's is the all-new, drag and drop 3D typical section creator from Beyondware that allows urban designers, contractors, transportation engineers and more to design, phase and communicate roads and streets in real-time. This PC application is easy enough for anyone to use, but powerful enough save your project time and money and amaze your clients.



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