AUGIWorld
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April 2019

Effective Collaboration

Also in this issue:

- What CAD Managers Should Stop Doing
- Collaboration with Shared Views in 3ds Max
- Collaborate with Documented Workflows

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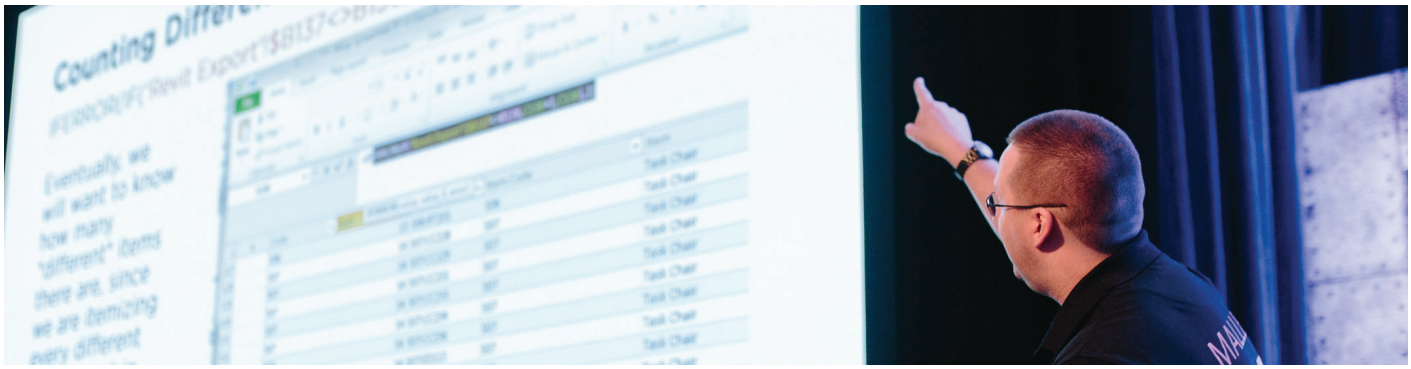

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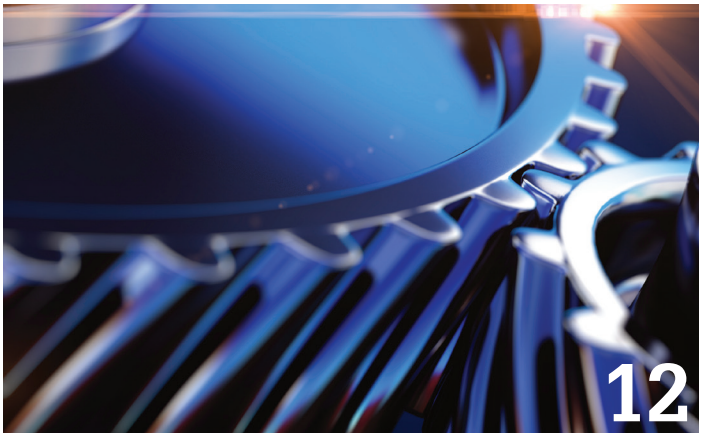

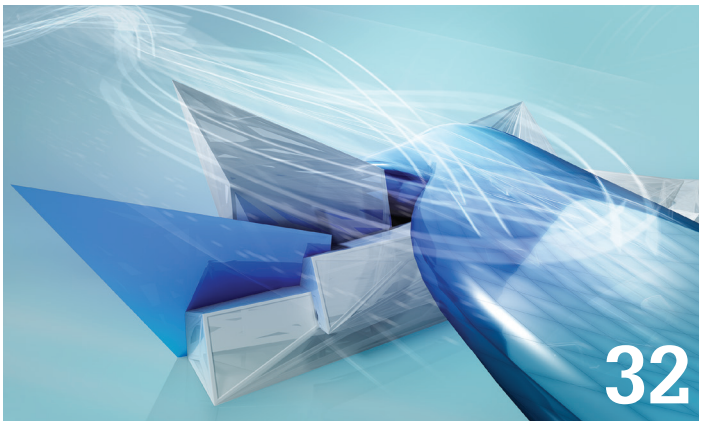

columns

Cover Image:

Letter from the President

GREETINGS!

April in our house means lacrosse season for my boys! If you have never watched a lacrosse game, it is fast-paced and exciting like ice hockey, but with fewer broken teeth (although one son did manage a dislocated jaw one year). Having watched my boys grow through the sport, it is amazing to me (Miss No-Athletic-Ability-Whatsoever) how intense the games can be. Lacrosse is a team sport, with specific roles for each player. Playbooks are filled with strategies similar to other team sports. No one player can be successful without their teammates, and each player knows and executes their individual responsibilities for the good of the team.

Whether building a structure or manufacturing a vehicle or engineering a life-saving piece of medical equipment, collaboration software can be a vital part of the process. Software and technology have helped to bolster collaboration among teams. Models can be shared among team members across different disciplines with little configuration required. Having three-dimensional models allows for more realistic visualization and earlier understanding of construction, manufacturing, and project outcome.

With the advent of BIM (Building Information Modeling), project collaboration has invoked a sort of paradigm shift, specifically in the AEC industry. What used to be a very linear process from design to construction to occupancy has become more of a team effort from the very beginning. Terms such as "federated models," "levels of development," and "clash detection with simulation" have become common vocabulary among project teams. Collaboration meetings occupy conference room schedules, sometimes on a weekly basis.

Whatever industry you are in, collaboration is always a key to success. Even if you are a solo contractor, like myself, you hopefully have clients and other consultants that you work with on a daily basis. For multi-disciplinary firms, collaboration is sometimes the only key to project sanity. This issue of *AUGIWorld* brings the experiences of our AUGI authors in the realm of collaboration. Remember there is no "I" in TEAM!

Game On!
Kimberly

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by: Brian Chapman

3ds Max Collaboration with Shared Views

This article will focus on presenting the Shared View tool. The tool, installed with the latest versions of 3ds Max, assists those who have Autodesk accounts with collaboration.

To launch the tool, navigate to the File Menu and select the menu option displayed in Figure 1.

Selecting the menu option will launch the dialog box displayed in Figure 2.

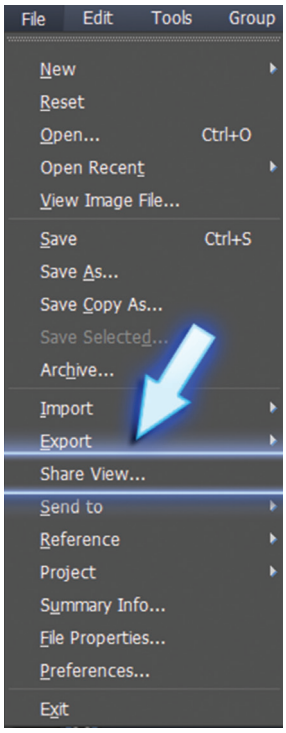

Figure 1: Menu selection

The dialog box allows us to name our view and contains three options:

- Share Selected Objects Only
- Share Hidden Objects
- Optimize scene data

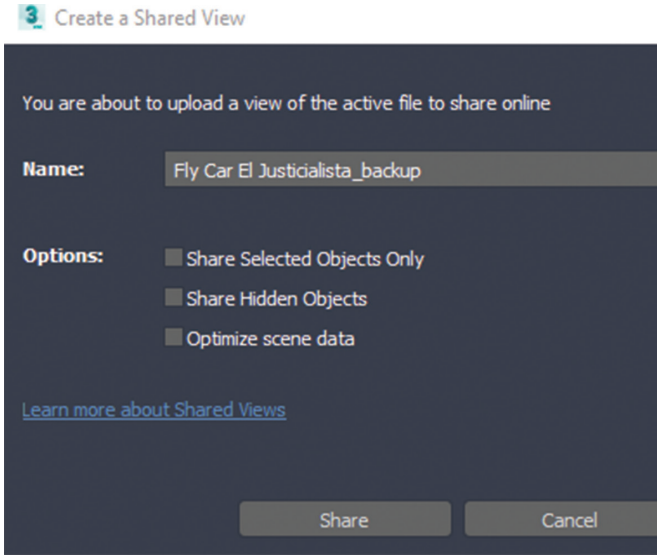

Figure 2: Shared View dialog box

The shared view supports bitmap types, many procedural maps, and textures (including OSL), Vray materials, and more.

The Share button displayed in Figure 2 will upload the view to our Autodesk subscription account. Upon a successful upload, the dialog will provide two options for us to share our information. The first option is to view it online through a browser. Selecting this option will launch the Autodesk Viewer and display our scene (see Figure 3). The second option will copy the link to our clipboard to paste for email.

Viewers have all the options they should need to review our work and comment. See Figure 4 with the exploded function selected and comments added for the demonstration with this article.

The views remain active for 30 days. So far everything I've shared has uploaded quickly and without errors. Let me know how it works for you.

Brian Chapman is an Autodesk Authorized Developer, creator of Pro-Cad.Net and a Senior Designer for an engineering firm located in Las Vegas, Nevada. Brian can be reached at procadman@pro-cad.net.

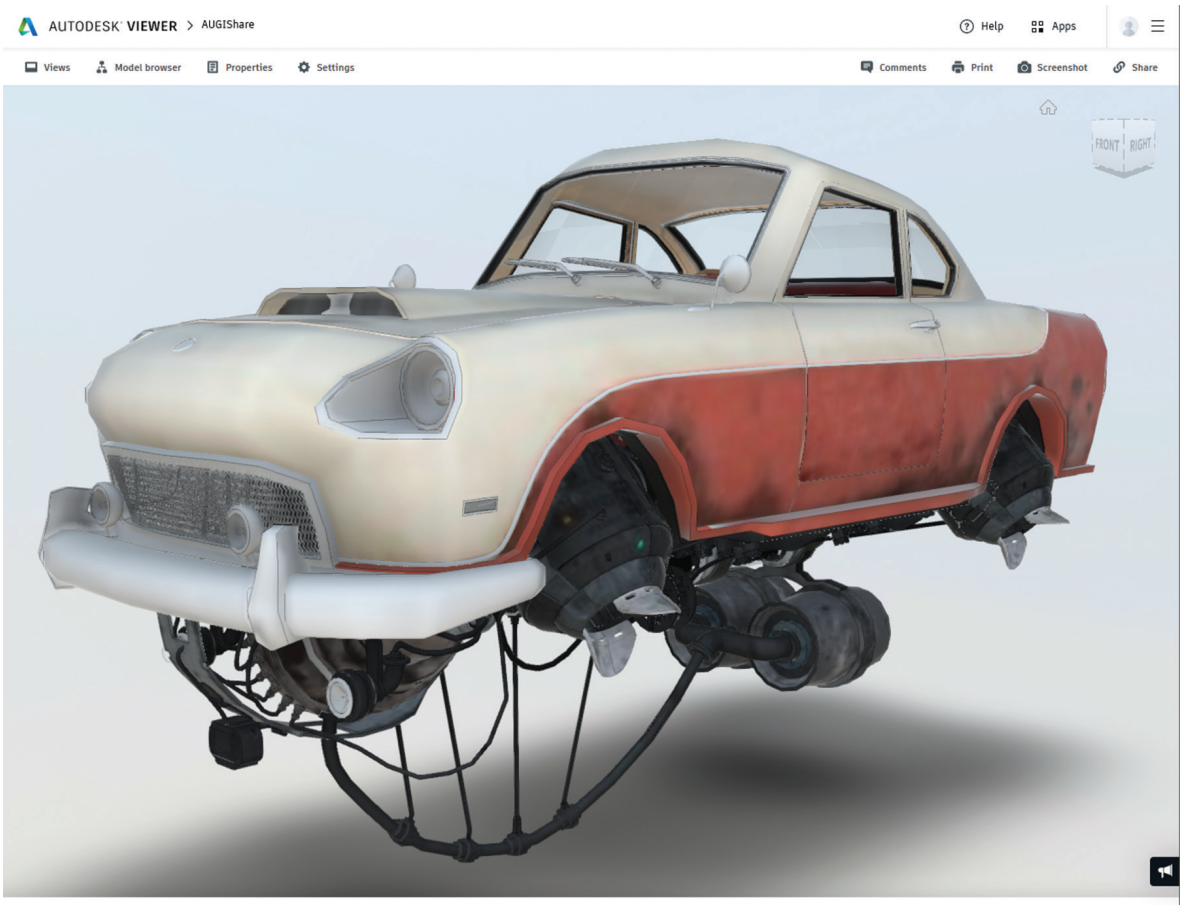

Figure 3: Shared View with Autodesk Viewer

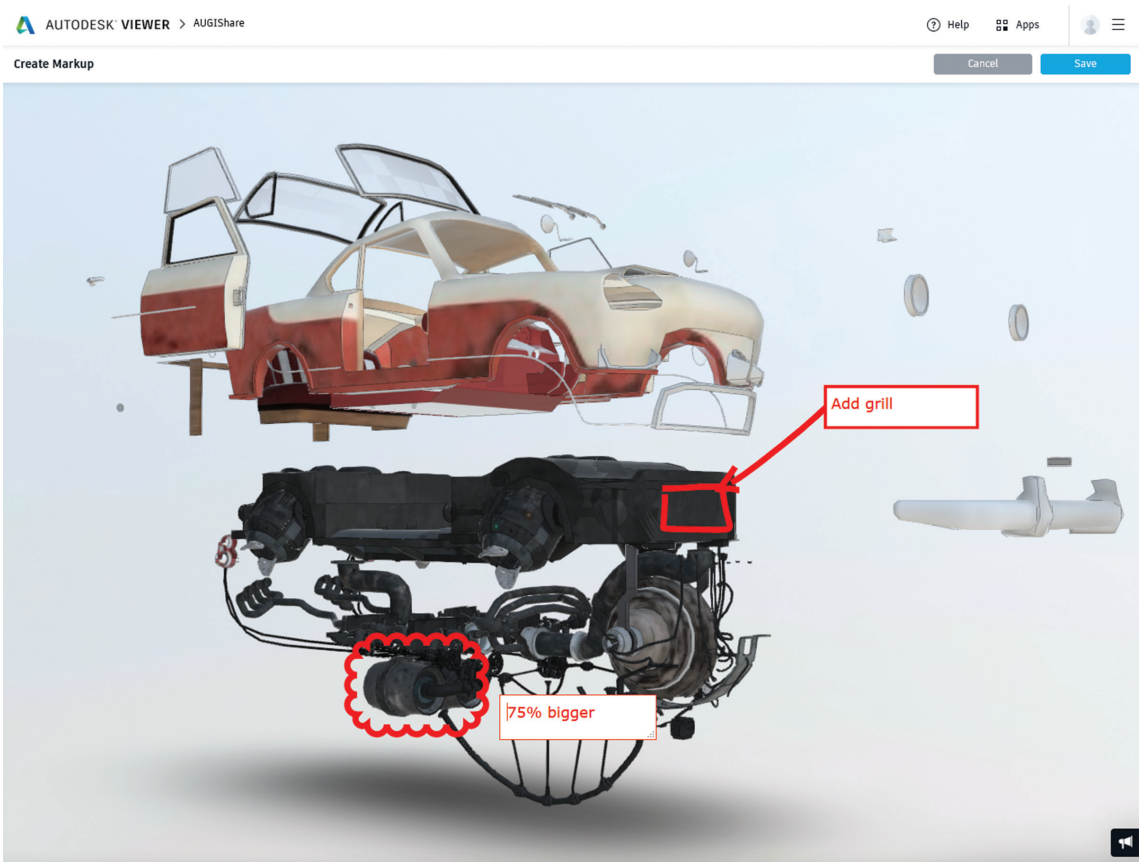

Figure 4: Exploded option with comments

by: Philip Russo

Quality Control Views Are a Must

With this month's *AUGIWorld* focus being collaboration, I felt like covering something that I am passionate about. Having established views that are set up for quality review is a must. And not only the views, but associated view templates and filters as well. To this day I come across project workflows that act as if we live in a paper world and it is all about the construction documents. There is some partial truth to that; however, we really need to leverage all that Autodesk® Revit® offers. This is all basic stuff that we need to revisit from time to time to ensure our templates and our documented workflows are efficient.

VIEW LIST

Let's start with the views in your model. A View List is a standard, out-of-the-box schedule you can create. As you can see from the list in Figure 1, there are several view properties that can be scheduled. Some properties I like to look at are the view name, view template, and discipline of the view. These are key for me from a standards point of view to ensure the project is following company BIM Standards. By having this schedule already set up in my templates, I have a place to go that is quick and efficient to review. I can make all changes necessary and this will save me time doing QC work on the project.

Depending on your firm, your workflow, and your consultants, you may have different items you are responsible for when coordinating projects. No matter your scenario, you must use filters and create coordination views to assist you in this task. For example, let's assume your primary discipline is Structural and you are working with an outside architectural consultant. With this scenario often both models may have duplicated efforts with floors, columns, and walls. Most views in your Structural model will only show what you are modeling and documenting. However, there must be an effort to make sure both models are coordinating these elements.

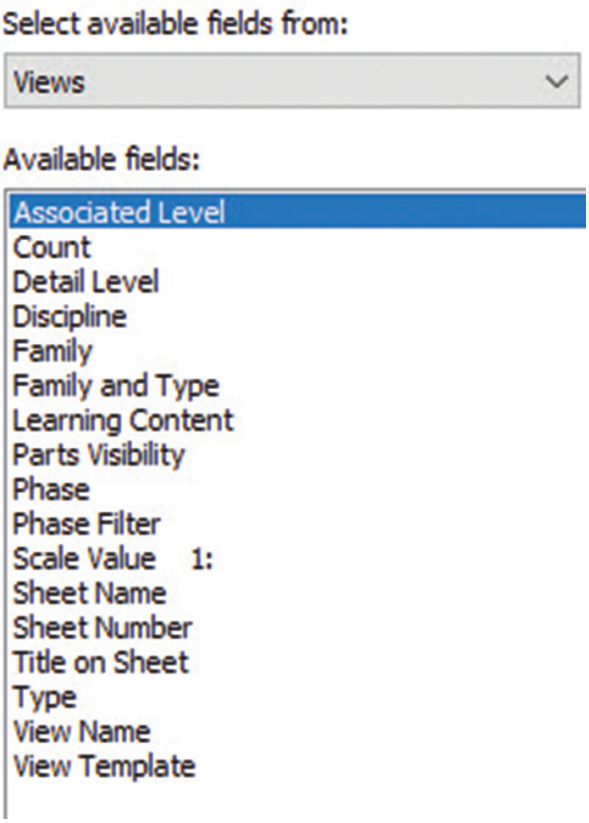

Figure 1: View properties

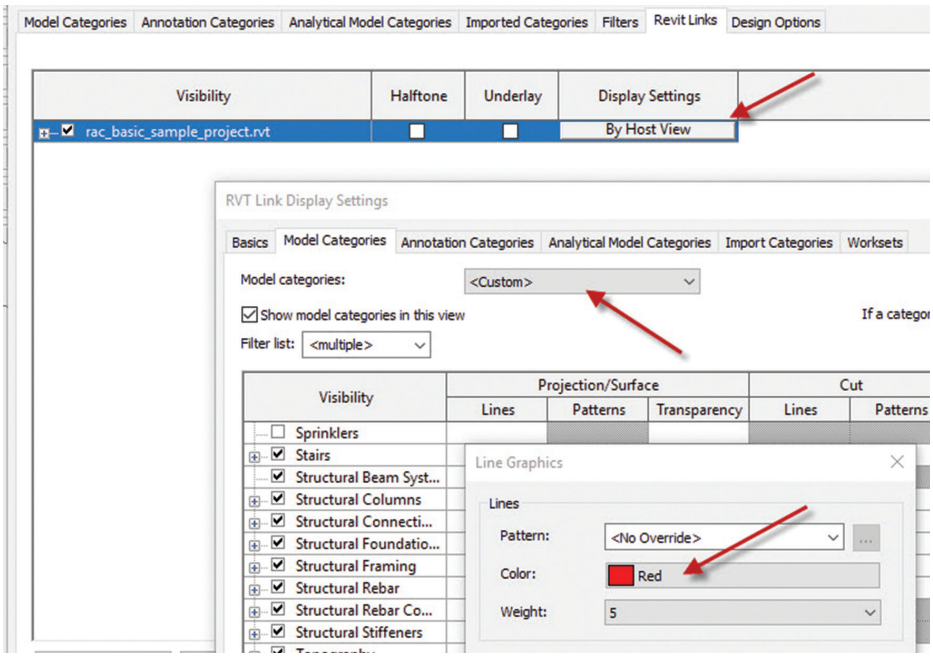

Figure 2: Visibility graphics overrides in linked files

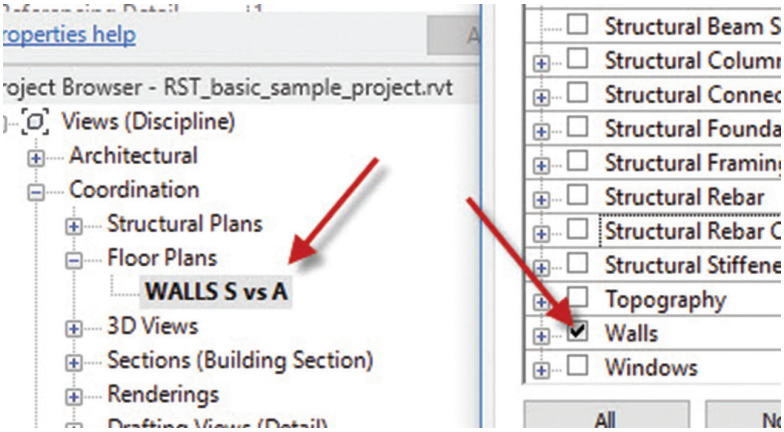

Figure 3: Project browser organization

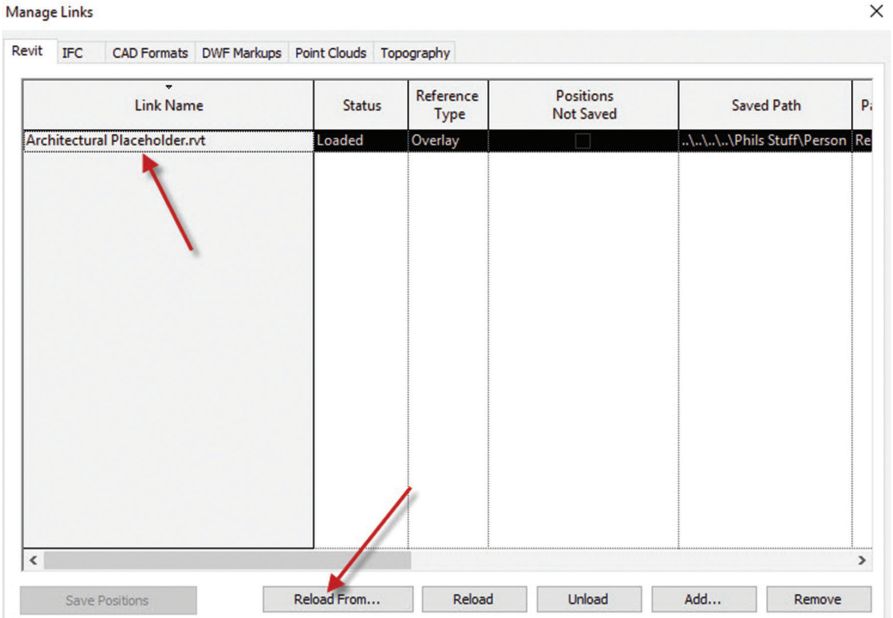

Figure 4: Discipline-specific model placeholder

VISIBILITY GRAPHIC OVERRIDES

As shown in Figure 2, a simple graphics override can help identify the walls in the Architectural model versus the walls in your Structural model.

In your project browser you can have a view set up already that is showing the wall category only, the discipline of the view is Coordination, and the name of the view makes it obvious what it will be used for. You can have coordinating section views as well. Make your views serve a specific purpose with isolated graphics and color overrides. This eliminates a lot of clicks and confusion while coordinating with other trades.

PLACEHOLDER

Your Revit Structure project template should have some placeholder for other trades that will assist you in fine tuning your view templates. For example, in your Architectural Placeholder Revit model you may want to draw every architectural element so you can test your visibility graphics and view templates.

Once this is established in your project start-up template, you can select "reload from" in your Manage Links dialog box to redirect the placeholder to the actual Architectural model. You may have to adjust for coordinates, but your coordination views and view templates will immediately go to work for you in your efforts.

SLAB EDGE COMPARISON

Architectural models will use floors and slabs, which will also be found in your Structural model. Another recommended coordination view would be for slab edge comparison. Turn off all categories in your Structural model except your structural foundations, floors, and slabs. Override the visibility graphic display of your Architectural model and make the slab and floors a unique color. Test this coordination view with your placeholders in your project template. You may consider creating view templates for these coordination plan and section view settings.

View templates are great for assigning them to views in your project template. But let's not forget they can be assigned "temporarily" as you are working. You may find yourself modeling some supports around a stairwell and want to

Revit 2019 – Structure

Figure 5: Temporarily apply template properties

check the architectural floors against your structural floors. This is a perfect opportunity to assign the view template "temporarily" to your view as you are working.

STARTING VIEW

A great opportunity for keeping people informed during a project is the Starting View function found in the Manage ribbon. You can make a drafting view the Starting View in a project. Use that drafting view to post status, questions, or approaching deadlines. That way, when someone goes into the model it will be the first thing they see and instantly know the status of the project. If you have multiple trades working inside of Revit, you can take this one step further by having a Revit model that is only used to communicate to all trades. Everyone links in this "communication" model and makes it part of their Starting View. A BIM Coordinator can use this communication model to communicate across all disciplines working in Revit on the project. Sometimes stepping back to the basics is required to help launch you into the future.

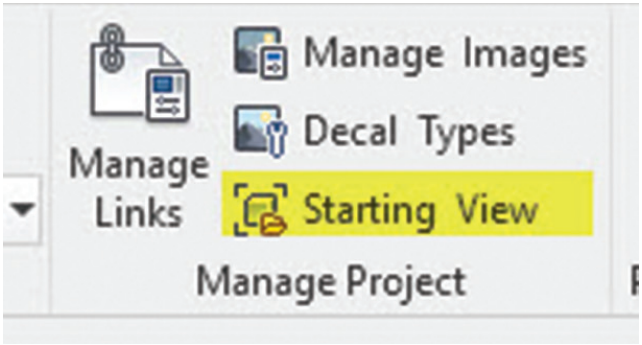

Figure 6: Starting View

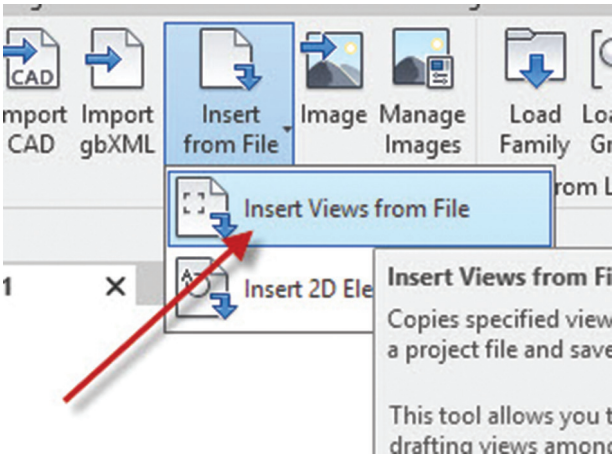

Figure 7: Insert Views from File

INSERT VIEW FROM FILE

Another view worth setting up in your project templates is a drafting view that lays out your office standards. This view is good for onboarding new employees and sharing with consultants. They can insert this view into their project file from your project file. Or better yet, maybe this drafting view is stored inside the "Communication" model so all consultants can have access.

All these items are basic, but effective when used properly. Instead of explaining step-by-step instructions, I just wanted to give you the concept and make you think about your current project templates. Whatever your role on a project, the goal is always to have better collaboration, work more efficiently, and execute a consistent deliverable.

Philip Russo has 33 years of national experience with CAD and BIM implementations, training, and consulting. He began with AutoCAD version 2.5 in 1986. Through the years he has held positions in the CAD industry such as CAD Draftsmen, CAD Manager, and Sr. Applications Engineer, and is a Certified Autodesk instructor. Recently, Philip's focus has been on the implementation of standard practices for the Revit platform. He has been a national speaker at Autodesk University, BIM workshops, and local user groups. Philip writes articles for AUGIWorld magazine, has held the position of Revit Structure Content Manager, and was elected to the board of directors for AUGI (Autodesk User Group International). As the Corporate BIM Applications Manager with O'Brien & Gere, Part of Ramboll, Philip is currently responsible for the delivery of technical solutions, workflow, support, and training for major complex and diverse projects. He is also responsible for providing project support, coordination, and workflow suggestions. Philip communicates with clients and specific project teams, and may also direct and instruct the technical staff during a project's progression. He can be reached at philip.russo@obg.com

by: Mark A. Conway

Documented Workflows: A Key Collaboration Tool

We all use workflows. From the time we take our first AutoCAD® class we're taught techniques that develop into personal workflows. Over time these get ingrained into our minds and muscles. We seldom write them down or document them in any way because they are second nature to us. They serve us well and, hopefully, are profitable for us. These workflows instill themselves as an essential part of our occupation. In a single-user or smaller engineering firm they are adequate for the day-to-day drafting and design tasks required for project efficiency.

But in larger firms with multidisciplinary departments like Survey, Land Development, Structural and Municipal Engineering, and a constant revolving door of employees, documented workflows become an absolute necessity. Documented workflows provide a standard for drawing consistency, a stable guide for project collaboration between departments, and a tool for training or retraining mind and muscle memory for incoming associates.

IN LARGER FIRMS WITH MULTIDISCIPLINARY DEPARTMENTS…DOCUMENTED WORKFLOWS BECOME AN ABSOLUTE NECESSITY.

WHAT IS A DOCUMENTED WORKFLOW?

Documented workflows are company standard documents

THE WORKFLOW SHOULD BE GENERAL ENOUGH FOR THE BEGINNER CAD USER TO FOLLOW, BUT NOT SO BASIC THAT IT FAILS TO UTILIZE THE POWER OF THE SOFTWARE OR THE ADVANCED UNDERSTANDING OF THE EXPERIENCED CAD USER.

designed by the CAD manager and/or a committee of power CAD users who determine the best possible process for achieving efficient results within the parameters of the software as it applies to the project lifecycle. They may be in the form of PDF documentation or video files. Drawing templates for 2D graphics, 3D models, title blocks, legends, and supplemental layer standards are then created or altered based on these documented workflows to establish a consistent build and appearance to project drawings. They can be as complex as a 14-page outline for Designing ADA Accessible Curb Ramps, or as simple as a two-minute video on Adding Labels to a Pipe Network Profile.

However, in creating the documents, the CAD manager must be aware that the workflow should be general enough for the beginner CAD user to follow, but not so basic that it fails to utilize the power of the software or the advanced understanding of the experienced CAD user. This middle-ground can often be difficult to achieve. However, with a few pages of basic procedure and valuable input from the design staff who will actually be using the workflow, the CAD manager should be able to get a handle on the skill level and depth of explanation required for the users.

The construction of a documented workflow begins when a designer contacts the CAD manager and asks, "How do I…?" This, for me, begins a quest to not only find a way to perform the task, but also follow that up with research and testing to develop the best way to accomplish the request with a workflow that functions within our existing process.

Topical Index

Assembly (Assemblies)

- Class 5 C3D 2017 Fundamentals-Assemblies and Corridors
- Class 6 C3D 2017 Fundamentals-Subassembly Targeting for Cul-De-Sac Design
- Class 8 C3D 2017 Fundamentals-Feature Line Corridors - Swale and Pond
- Class 9 C3D 2017 Fundamentals - Intersections.
- AGT 4-Multi-Baseline Corridor Design
- AGT 5-Cul-de-sacs, Advanced Targeting & Pond
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- AGT 7-Intersections and Advanced Utilities
- Adding Corridor Side Slopes
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AutoCAD Design Center (ADC)

- AutoCAD Design Center

Baseline, Corridor

- Class 9 C3D 2017 Fundamentals - Intersections.
- AGT 4-Multi-Baseline Corridor Design
- AGT 5-Cul-de-sacs, Advanced Targeting & Pond
- AGT 7-Intersections and Advanced Utilities

Basin (see Pond)

BIM

- Class 1 C3D 2017 Fundamentals-Intro and Data Sharing 1

These procedures are documented in PDF format available to all design staff at any time. Many of these workflows are subsequently demonstrated in regular company-wide webinars that are recorded for future reference.

Another beneficial idea that came from our users was to create a Video Library Index that makes finding the desired video more efficient. This index is categorized by directory and topic. By keeping a vast library of PDF and video documentation in an easily accessible system, collaboration between departments becomes more streamlined, training lessons are reinforced, and troubleshooting for the CAD manager can be as easy as "check out this video," saving time and money.

COLLABORATION BETWEEN DEPARTMENTS

Between departments, documented workflows can alleviate the struggle that often occurs when disciplines with divergent goals must collaborate on a single project.

The best example of this is between the Survey Department and the Land Development Department. Survey's goal is to provide accurate

Documented Workflows

Add Survey Data to Design Project Workflow

I. Insert Survey Figures and Additional Graphics into the SSP

A. Open the SSP drawing for the project
   1. Located at [Project Folder]\Design\CAD\Source Drawings\Plans
B. Verify that the UCS is set to World
C. XREF the **[Date] SSP Graphics** drawing provided by The Survey Department
D. Right-Click on XREF
   1. Select Bind...>Insert
   2. Explode the resulting Reference Block

II. Insert CoGo Points into the BIM

A. Open the BIM for the Project
   1. Located at [Project Folder]\Design\CAD\Source Drawings\Models
B. Verify that the UCS is set to World
C. XREF the **[Date] CoGo Points** drawing provided by The Survey Department
D. Right-Click on XREF
   1. Select Bind...>Insert
   2. Explode the resulting Reference Block
E. Update the Point Groups in the Prospector
   1. Labels will go to ^No Display

III. Insert CoGo Points into other Models and Production Drawings

It will be required for the design to insert the CoGo Points into additional Models or Production Drawings. To do so, follow Step II.B&C above with the following notes in mind.

1. Only add CoGo Points to Models where their data will be relevant
2. Only add the CoGo Points to Production Drawings where they are required to display
3. Never insert the CoGo Points into a Plan to be XREFed
4. Never Copy and Paste CoGo Points
5. CoGo Point Labels will not set to ^No Display in Models or Production Drawings

IV. Production Drawing Labeling and Annotation Notes

Many of the CoGO Points will be inserted with a Label already attached. This Label may be pulled into a Dragged State as required for drawing presentation.

The Existing Surface, if affected by the additional data, will Synchronize without input from The Design Team. However, additional Labeling may be needed as the design requires

The Survey Department may be able to provide additional annotations from The Survey Existing Conditions Plan to be inserted as a block into Design Production Drawings as required.

Annotate/Dimension New Survey Figure Information (XREFed via the SSP) as needed

Text and Dimensions may be Copy and Pasted from drawing to drawing.

Do Not XREF Text

documentation of what's out there in the real world via CoGo Points, Survey Figures, and Surface Data. In contrast, the Land Development engineers seek to overwrite this data with a design that fits the client's requests and reviewing authorities' requirements with AutoCAD® entities, Feature Lines, Corridors, and Grading Objects. Then, the design is thrust back to Survey for stake-out for construction.

The conflict occurs, first, when Land Development fails to understand how the Survey Objects work and attempts to treat them as standard AutoCAD entities. Then, again, when the project is passed back to Survey and there is no clear understanding of how the project drawings are constructed. External References and Data References abound and where the correct data for stake-out can be found is anybody's guess. Enter the documented workflows. A documented workflow of how the Survey Department is to "build" the initial Boundary and Existing Condition Site Plan as well as how to handle the CoGo Points and Surface Reference when constructing the initial Building Information Model (BIM) standardizes the types of files Land Development should expect to receive. This gives them the opportunity to verify that they have a complete data set to begin the design.

A documented workflow for how Land Design is to handle 2D Design Plan Graphics, 3D Model Data and where to appropriately use labels and text gives them the guidelines for creating project files that can be more efficiently used later by the Survey Department for construction documents. Survey will know the location of the data they need to complete their tasks.

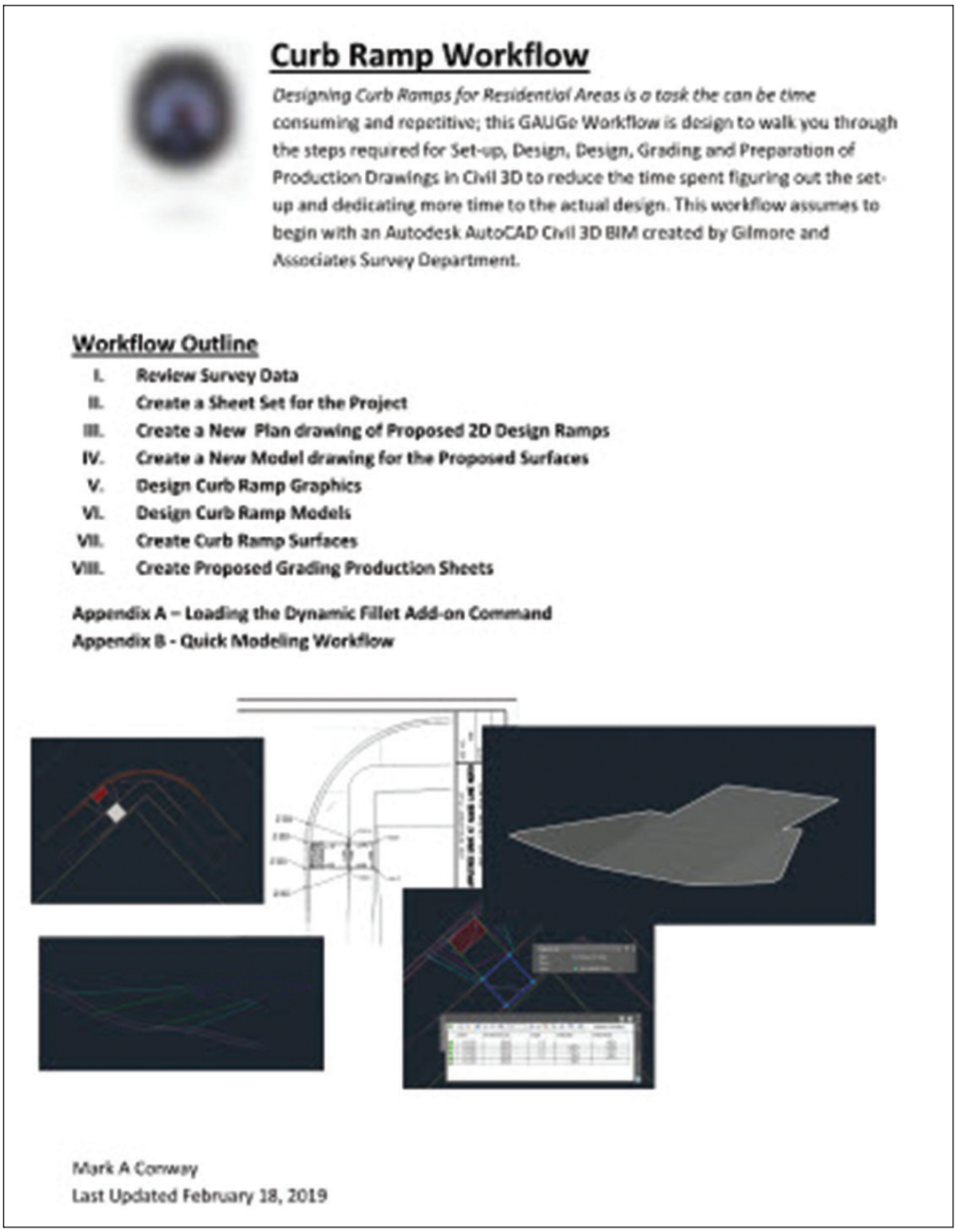
Between the departments there must also be documentation for how to handle demolition of the Existing Site Features or the addition of supplemental survey data, meaning that Land Design must now get their hands on the coveted survey data objects and understand how they function.

Writing down these workflows can greatly reduce the amount of interdepartmental conflict that often occurs in multidiscipline firms. Other similar struggles can occur between Survey, which works in foot units in a Geo-coordinate system, and Structural Engineering, which works in inch units on an orthogonal plane. A documented workflow of how to incorporate Structural Engineering's design into the Geo-referenced Survey drawings will go a long way towards expediting a positive project outcome.

NEW EMPLOYEE TRAINING

New employees bring a fresh outlook and new energy to a firm. What they lack is experience. The software now performs many of the necessary calculations dynamically. In turn, today's civil engineering environment has evolved and, as a result, in many cases, the dedicated drafter has gone the way of the Dodo or has become the CAD Manager.

Now, recent Civil Engineering graduates populate our offices and most have had little to no CAD training. Beyond the three-day AutoCAD Basics class and the four-day Civil 3D Fundamentals "Fire Hose Training," newer employees need a click-by-click documented workflow to fall back on to help them develop the techniques that will get them pointed in the right direction.



Curb Ramp Workflow

Designing Curb Ramps for Residential Areas is a task the can be time consuming and repetitive; this GAUGe Workflow is design to walk you through the steps required for Set-up, Design, Design, Grading and Preparation of Production Drawings in Civil 3D to reduce the time spent figuring out the set-up and dedicating more time to the actual design. This workflow assumes to begin with an Autodesk AutoCAD Civil 3D BIM created by Gilmore and Associates Survey Department.

Workflow Outline

I. Review Survey Data
II. Create a Sheet Set for the Project
III. Create a New Plan drawing of Proposed 2D Design Ramps
IV. Create a New Model drawing for the Proposed Surfaces
V. Design Curb Ramp Graphics
VI. Design Curb Ramp Models
VII. Create Curb Ramp Surfaces
VIII. Create Proposed Grading Production Sheets

Appendix A – Loading the Dynamic Fillet Add-on Command
Appendix B - Quick Modeling Workflow

Mark A Conway
Last Updated February 18, 2019

Documented workflows also provide them with the basic understanding of the BIM process and following company standards for drawing content and presentation. Performance expectations may expand as the trainee shows potential for adhering to and adapting to the documented workflows provided.

INCORPORATING VETERAN TALENT

Veteran CAD employees coming to your company from a different firm will have been trained in workflows which may be, and quite probably are, significantly different from your company standard. Documented workflows should provide a step-by-step procedure for retraining their minds and muscles from "old habits" developed in their previous workplace into techniques more conducive to their new employers' expected results.

Experienced employees bring skills and talents that can be integrated with the current process. Their knowledge is a useful commodity. It is of intrinsic value to incorporate their ideas into the discussion. To make this a more positive transition, the veteran must appreciate the value of the current workflow before offering changes. This can only be accomplished if the workflows are documented.

GET STARTED TODAY

If you find yourself in the position of CAD Manager at a mid-sized or larger engineering company and there are not documented workflows for how the project drawings should be built beyond the standard "Make sure your line work is on the correct layer" speech, take the bull by the horns! Get started today.

Write down how you personally build a project. Get input from your co-workers on how they operate. Evaluate the results. Research online for how others handle difficult issues.

This is the hard part… make executive decisions. Follow that up by drafting your first official Documented Workflow and submit it to Management for approval. In due time, these workflows will prove themselves invaluable to you and your firm as they serve to streamline the standard project lifecycle, enhance the collaborative process between departments, train new designers in software functionality, and incorporate experienced acquired talent to your company's procedures.

Mark A. Conway is a Desert Storm Era veteran with 20 years of experience in the land development and wastewater treatment design fields with a focus on BIM Best Management Practices and software implementation. He is currently the Director of Design Technology for Gilmore and Associates in Southeast Pennsylvania. Mark can be reached for comments and questions at maccad3d@gmail.com

by: Mark Kiker

What Should I Stop Doing?

In March 2019 *AUGI World*, we looked at what a new Tech Manager should Start doing. Now we move on to the Stop list. Keep in mind that some might be offended when you begin talking about stopping something. It may be their pet project. It might be someone higher up the ladder that wants this item to be on the Continue list. Go lightly, but boldly move toward stopping the things that most people agree to terminate. Some things on this list are totally in your control, but for others it may take a bit of convincing.

So here are some ideas on what you may need to stop doing.

STOP THINKING "TECH ONLY"

One of the best things in the book I mentioned in the last article—*What Got You Here Won't Get You There*, published in 2007 by Marshall Goldsmith—is when Goldsmith writes, "All other things being equal, your people skills (or lack of them) become more pronounced the higher up you go. In fact, even when all other things are not equal, your people skills often make the difference in how high you go." This single piece of advice is worth the reading of the whole book. People skills will take you higher than tech skills. Tech skills got you here—but people skills will take you higher. Don't jettison your tech skills, just stop thinking that tech is all it takes. People matter now more than ever.

STOP TRYING TO BE A SUPERHERO

Technology heroes are making strides in every area and you may be one of those. Now that you are a manager, you need to keep your tech skills sharp, but not always swoop in and rescue the project. If all fixes must come from you, then you will be drained of energy by the avalanche of issues. You need to get problems fixed, but not always be the fixer. Invest in others who can be around when you are not. Get project teams to designate a liaison to whom you can teach the tech skill needed. Multiply the fixers and stop being the only one.

You can still continue to do the superhero stuff you used to do, but now on a grander level. You can fight the injustice of inequitable application of the standards by some. You can fight the nasty demons of personal CAD habits that tie projects into knots. And you can still maintain the courage to do CAD/BIM the right way. Stand tall, superhero, but also gather a league of heroes around you.

STOP DOING WHAT YOU USED TO DO

Following close on the heels of the last item, stop doing "only" what you were doing before. You need to keep the tech savvy meter high, but now you need to add new skills. Not just people skills, but also systems analyst skills and project management skills. You need to become a planner, negotiator, trainer, tester, and a corporate culture wiz. Building on strong tech skills and adding new management skills will allow you to work under, with, and over other staff. You need to work with the office politics and blaze trails around and through them.

Management Skills You Need

Project management
Vendor management
Process refinement
Team/personnel development
Delegation/division of labor
Manpower planning
Advanced problem solving
Solid communication skills
Change management
Negotiating and deal making

STOP SAYING "I" SO MUCH

You need to move away from starting sentences with "I." Like "I already know that" or "I already tried that and it did not work" or "I think we should…"

You can take the same tack, but morph your statements into questions or at least open-ended statements. Instead of "I already know that," you might say "Wouldn't you agree that…?" In place of "I already tried that," you could say, "We have not had much success with that, but we could give it another go." As an alternative to "I think…" you might say "What do you think about…?" The whole point is to not come off like a know-it-all or done-it-all. You can invite others to learn what you know or try what you tried without shutting them down. Help them to learn and discover—it sinks in better that way. And when there is a success, it is "WE," or "they," not "I." You can and will have personal wins, but don't brag.

STOP TALKING NEGATIVELY ABOUT MANAGEMENT

You are now part of the management team. You really should not have been bad-mouthing those above you, but now you need to zip your lip even more. You can still disagree with some decision and tell management that, but it must be done in private, not around the water cooler (do they still make those?). You are now part of the overall management team. Even in a large organization where you may be on the lowest rung, you are now seen by those around you as management. You have a foot in both worlds, production and management, but now you need to understand that the management hat is on your head.

STOP BEING SO CONTROLLING

This may sound counterintuitive, but let me explain. You got here by controlling and improving production. You streamlined, refined, customized, and narrowed the list of deviations from the standard. But now you may want to consider not being so "in control," or at least stop acting like you are in control of everything. Some early career managers try to over-control the processes they oversee. They clamp down because they finally have the clout. But people don't like that. They want to know that you will make things better, but not at the expense of their personal processes. When you need to make changes to processes… nudge, don't shove. If you need to control, do it wisely and slowly. Don't turn over every apple cart at the same time.

Next time we will dig into the Continue list. What should you continue to do and seek to improve? Until then, manage well.

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

Inside Track

by: Brian Andresen

Welcome to *AUGIWorld* 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.

ngSkinTools

http://www.ngskintools.com

ngSkinTools is a skinning plug-in for Autodesk® Maya®, introducing new concepts to character skinning such as:

Layers – Skinning layers are a central feature of ngSkinTools. With them, you break your rig down into easier manageable parts and edit them separately, then blend everything together through layer transparency. They're not just a simple way to make your work more organized, they also physically isolate groups of influences from the rest of the rig, so paint and edit operations won't mix in influences you were not expecting. This also allows you do things that were impossible before: per-layer mirroring, adjusting influence weight up/down through layer transparency, blend transferred weights with previous weights, etc.

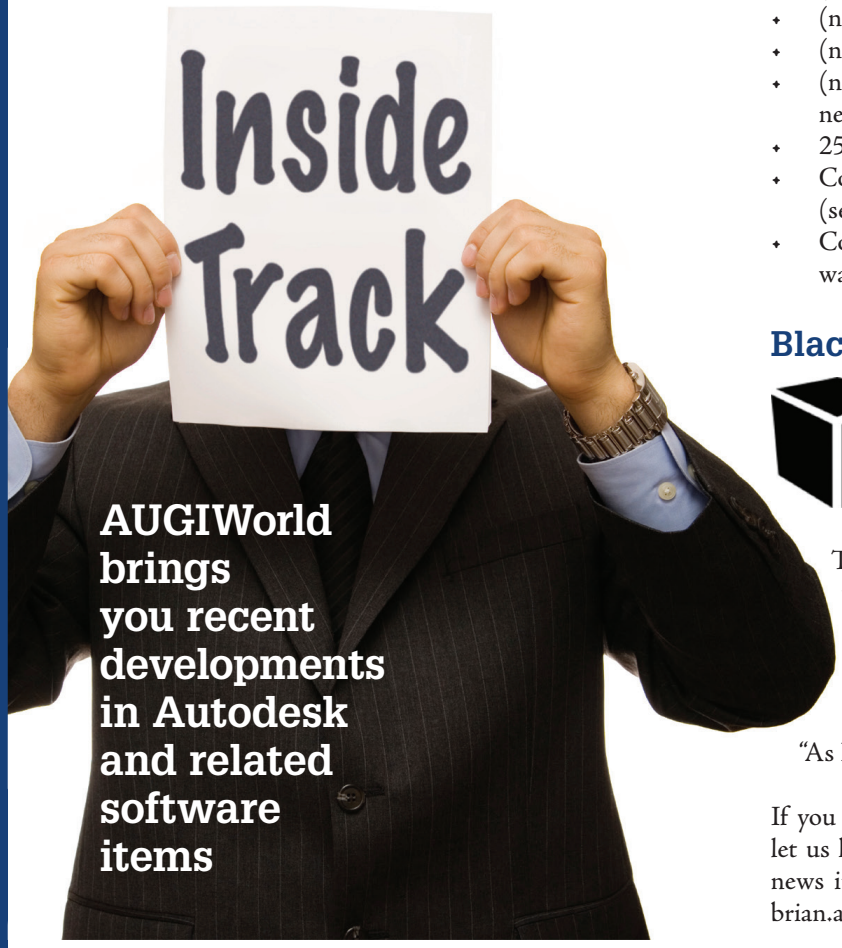
Mirroring – You won't need to go to T-pose again when going through paint+mirror cycle—you can mirror in any pose now. There's also a much greater control over what influences mirror onto which one: associating left-right influences by name without prefix, manual association overrides, etc.

Painting – ngSkinTools has its own set of paint tools, which are capable of working on a per-layer basis. Each tool maintains its own intensity, which is handy when toggling between smooth and replace through shift-modifier.

Smoothing – The new smooth brush gives much better results as it operates on all influences of a vertex at once. For even greater control, the more precise "relax weights" tool is there, which also can smooth across mesh boundaries and thin meshes.

Compatibility – ngSkinTools operate on standard Maya skinCluster (also known as "smooth skin"), so no custom nodes will be required to use your rig.

Performance – All the computing-intensive operations are being handled by a C++ plug-in, and are being constantly tested on high-resolution meshes.



AUGIWorld brings you recent developments in Autodesk and related software items

Relink Bitmaps

https://bit.ly/2UlS3pO

Relink Bitmaps is a script to easily relink all missing files (Bitmaps, VRayMeshes, Mental Ray Proxies, VRayHDRI, IES, etc) when they change directories or when you move computers.

- All 3ds Max® supported Bitmap Texture types
- (new) Relinks Mental Ray Proxy files
- (new) Relinks VRay Proxies (.vrmesh)
- (new) Relinks VRayHDRI files
- (new) Relinks IES files (including VRayIES files)
- (new) Automatically checks for script updates and new versions
- 250% speed increase from previous versions
- Command-line mode available for automating repetitive tasks (see documentation on the website)
- Configurable default user options saving button clicks and wasted time

BlackBox ViewportGrip

https://bit.ly/2UpAvsO

BlackBox ViewportGrip for AutoCAD® allows users to choose how the Centroid & Viewport Grip behave.

This app provides a new VPGRIPMODE system variable that can be used to disable the Centroid & Viewport Grips, disable the Viewport Grip (Centroid Grip enabled), enable the Centroid & Viewport Grips (Fixed, no size change when scaled), or use the default OOTB functionality (faulty, changes size when scaled "As Designed").

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: brian.andresen@augi.com

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by: Sam Lucido

Using Layers for Collaboration

Collaborating effectively in a team can be defined as all of us being on the same page. Defining a layer standard in AutoCAD® can be a very effective way to maintain standards and have easy collaboration within the team. Layers are a fundamental feature of AutoCAD, used to apply colors, linetypes, lineweights, transparency, as well as control plotting characteristics. Not using layers efficiently or placing everything on layer 0 will only cause rework and headaches for the next person working on your drawing. It is critical to understand layers and use all the tools within AutoCAD to your full advantage. In this article we will review how you can use the features of layers to improve the process and set up a collaborative approach to complete the task or goal.

WE ALL WANT TO BE FIRST

Let's start by examining how AutoCAD sorts layers. The best place to start is within the layer names themselves. On the home tab of the ribbon you will find the layer panel located within the center of the ribbon tab as shown in Figure 1. Open a drawing, select Layer Properties, and examine how the layers are sorted within the file.

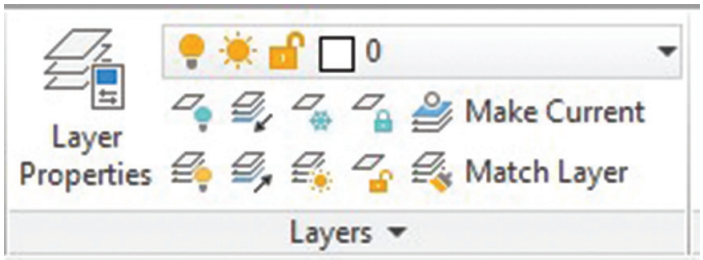

Figure 1

The name of the layer can be the first step in controlling layers. By default, layers are sorted by name. If you give layers logical names, it becomes easier as drawings become more complicated. From the image below you can see the layers are sorted alphabetically starting with an "A" as the main descriptor. I added B and C to show how the layer sorts. You can select the name column to reverse the order as shown in Figure 2.

The AutoCAD out-of-the-box template file does not include any layers, so you need to establish this standard on your own. Have

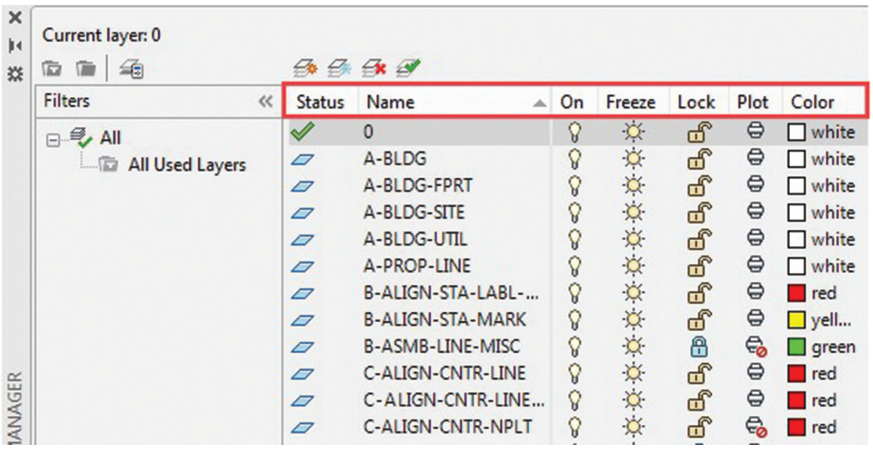

Figure 2

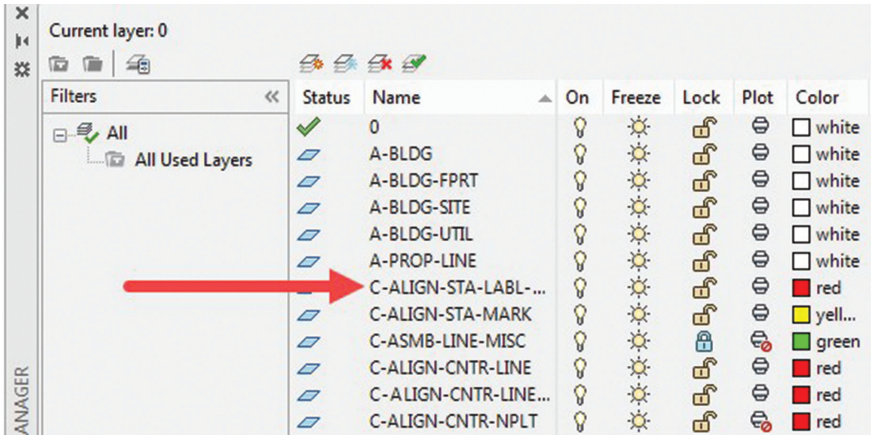

Figure 3

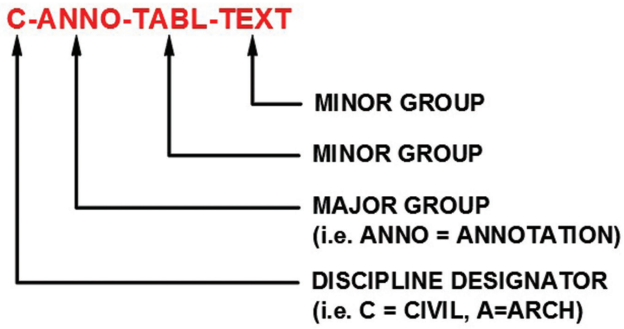

Figure 4

you ever looked at the layers provided within a AutoCAD® Civil 3D® drawing file? Figure 3 shows the layers that are provided within the Civil 3D Template.

The layers created in the Civil 3D templates follow the National CAD Standards Rules (NCS). For more information about the National CAD Standards layering settings, see http://www.nationalcadstandard.org.

The layers follow the NCS standards as follows, with each element separated by a dash (Figure 4):

<Discipline Designator> - <Major Group> - <Minor Group> - <Minor Group>- <Status>

Discipline Designator: Required; the AutoCAD Civil 3D templates use the C and V discipline designators, which stand for Civil and Survey/Mapping. The discipline designator is one letter.

Major Group: Required; identifies elements such as roads, topographic elements, and storm sewers. To adhere to the standards, custom Major Group fields are not allowed.

Minor Group: Optional; identifies sub-elements such as road profiles. You can include up to two minor groups per layer name, and you can define your own custom Minor Groups. For example, the layer C-ANNO-TABL-TEXT has two Minor Groups: "TABL" and "TEXT," both consisting of four letters.

Minor Group: Additional layer classes.

Status: There can also be a one letter status indicator on the end.

Your project discipline and company standards define how you create a collaborative layer approach that can be used for your company. Using this system along with templates can prove to be a very effective implementation plan. Architectural drawings follow a similar layer standard from the American Institute of Architects (AIA) published guidelines follow a similar layer convention: https://www.aia.org/. The layers are more designed for architectural projects rather than civil.

THE TEMPLATE FILE

Open the acad.dwt as shown and add all the layers including their properties to the file and save as a standard template name (i.e., Layers.dwt). Creating a standard set of layers and saving them in a drawing template file makes those layers available for use when starting a new drawing with that template file.

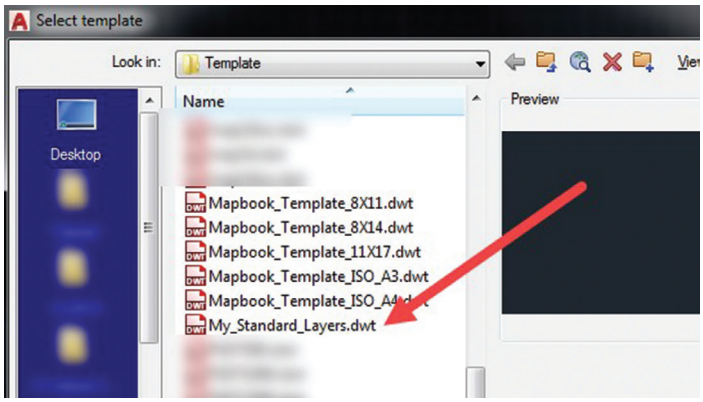

Figure 5

AutoCAD 2019

All you need to do when you begin a new drawing is select that template file, then ADD the layers for your standard and save the file as shown in Figure 5. Next time you create a new drawing with this template all your standard layers will be imported and included within your drawing session.

Next up, let's talk about organizing our layers with filters.

MANAGING YOUR LAYERS WITH FILTERS

There are two kinds of layer filters in AutoCAD. These filters allow you to create named sets of layer selections involving many different disciplines. The two buttons shown above the filter section will navigate you to the correct filter as shown in Figure 6.

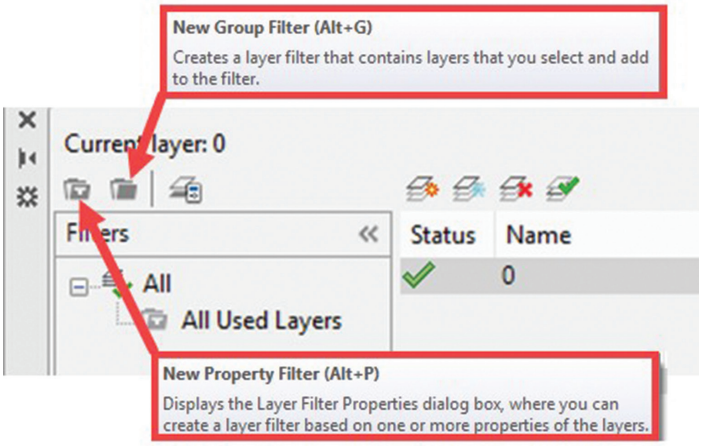

Figure 6

To create a group filter, select the New Group Filter button in the filters list as shown and the filter will be added. Follow the steps in Figure 7 to create your group filter.

1. Rename the filter to a logical name.
2. Highlight all the layers you want to be in that group (they do not have to have the same properties or a common name).
3. Drag the layers to the filter.

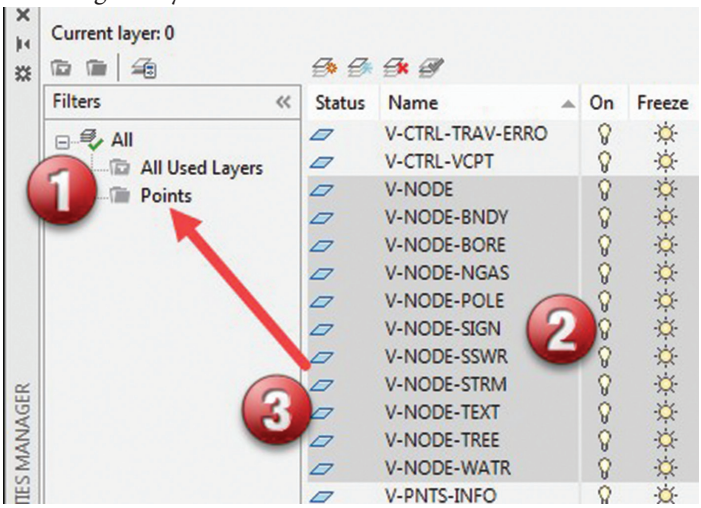

Figure 7

A more detailed way to stay organized is with a properties filter. Upon selecting this button, you have more flexibility based on the layer names you choose. In this example we are going to give a simple criterion—including all the layers with a prefix of A and then we are going to add all the layers with a prefix of V. Keep in mind you can use wildcards (*) after the character to include all the layers with those features as shown in Figure 8.

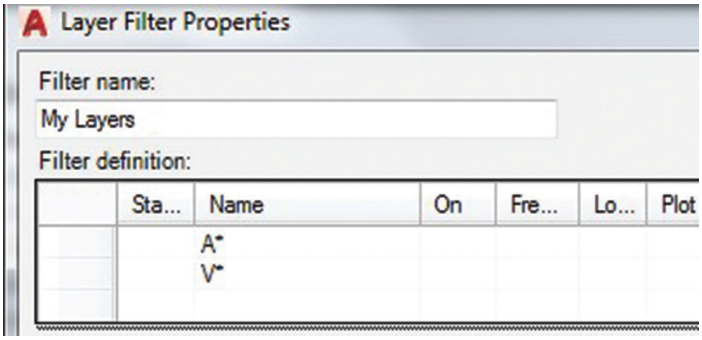

Figure 8

After you add the letters with the wildcard, select OK and you can now view the layers in your properties filter as shown in Figure 9.

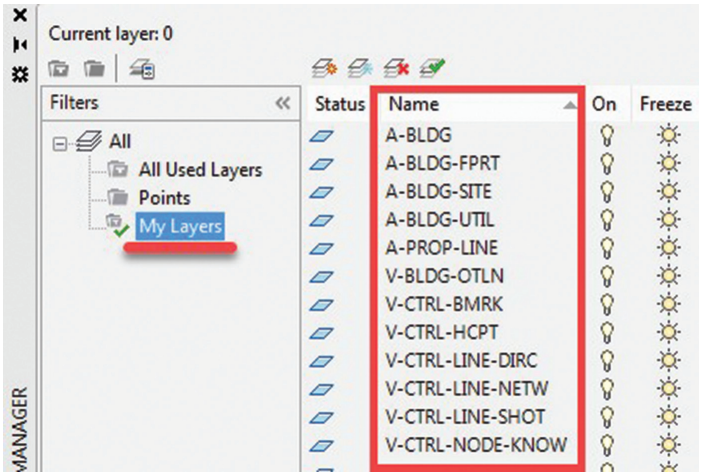

Figure 9

DESIGNCENTER TO THE RESCUE

Now what about those drawings you get from a surveyor, client, or the new person in the office who did not set up the file correctly? You can simply insert your template into the drawing file at 0,0 and all the layers will be added in. How about using DesignCenter? From your problem drawing, type ADC at the command prompt and navigate to your template file as shown in Figure 10.

1. Select the Layers Tree item and all your layers will be displayed in the window.
2. You can select all the layers or just the ones you need and drag and drop into your drawing. All your standard layers will now be inside your new drawing.

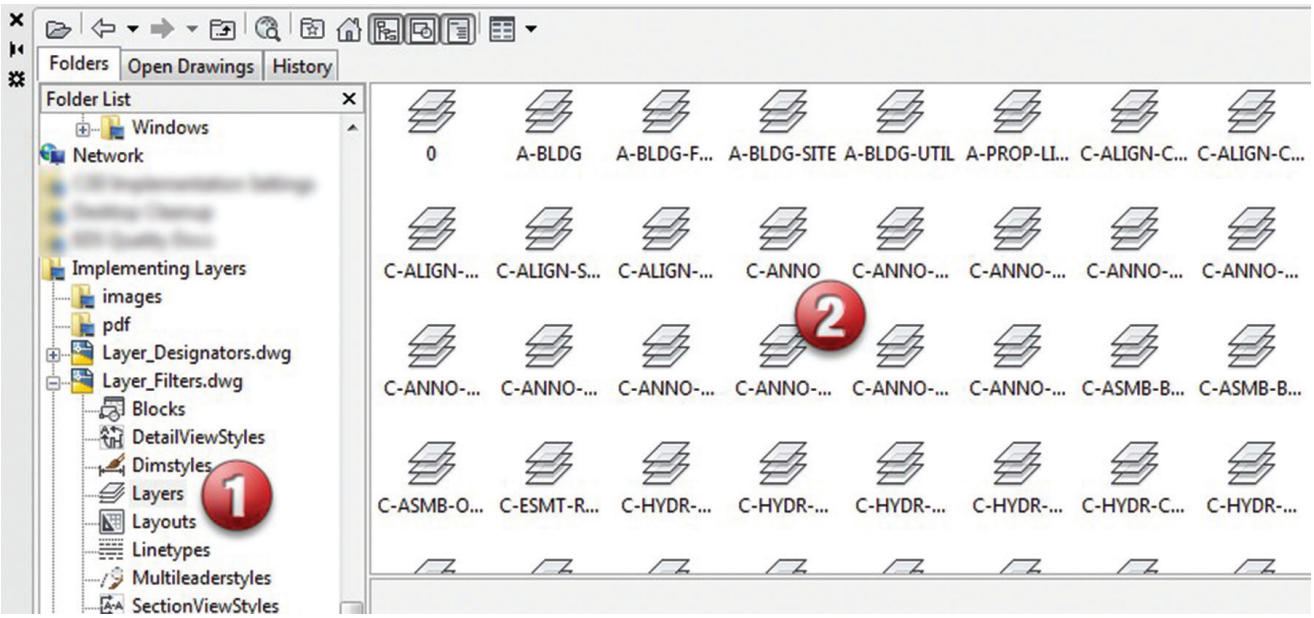

Figure 10

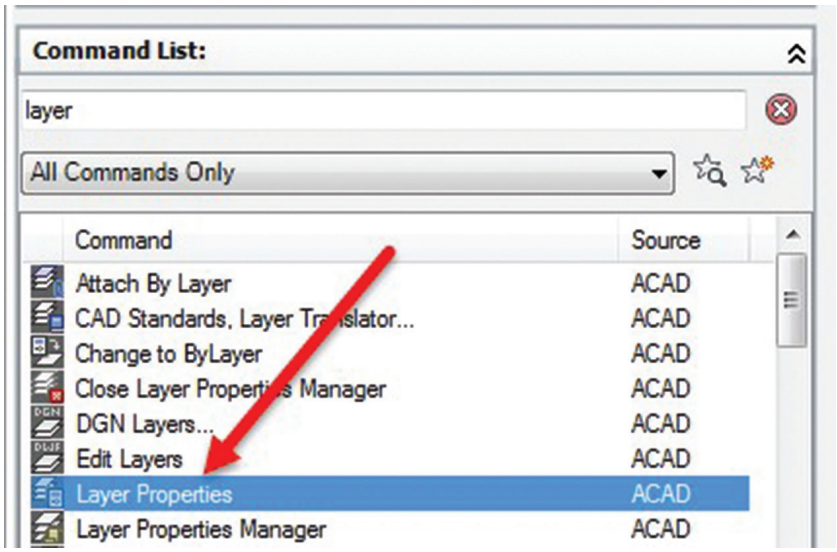

Figure 11

CREATE A MACRO TO FORCE A STANDARD LAYER

You can use macros to create standard layers within your file. Follow the sequence below to create a button macro that will set a current layer and its properties from a button. By selecting the button, the macro will force any current layer properties to the new properties in the macro.

1. Type CUI at the command prompt then layer in the command list to get the command as shown in Figure 11.
2. With your tool palette open, left-click and drag the Layer Properties Command onto your palette. Note: we only want to get the image and the start of the command in there. Figure 12 shows the layer command added to a blank palette.
3. Right-click your layer command in the palette (Figure 12) and select properties.

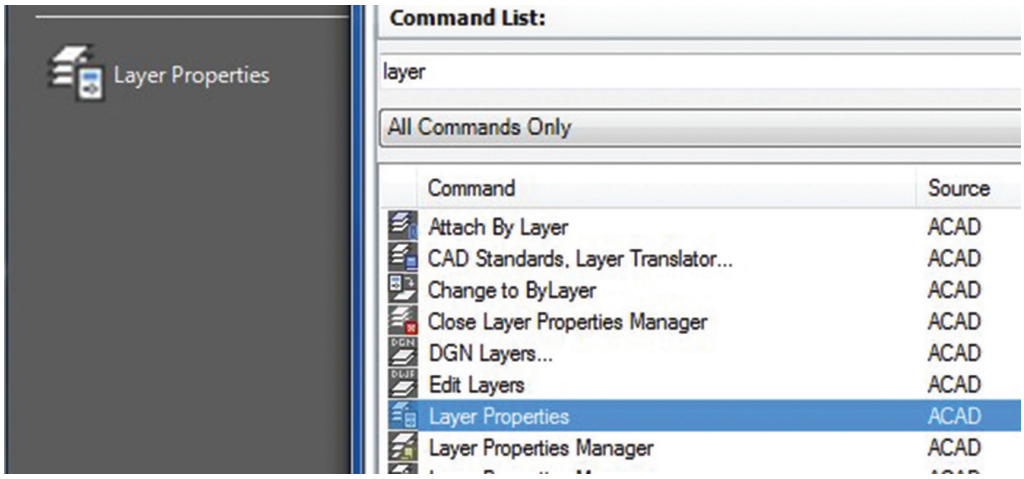

Figure 12

^C^C_-layer;m;AU-DEFAULT;C;2;;LT;HIDDEN;;;^C

Follow the sequence as is on the command line. Notice the number of returns which are represented by a semicolon in the command string shown in Figure 13. Enter the command string and select OK. Your button is now ready to use—forcing a standard layer in your drawing.

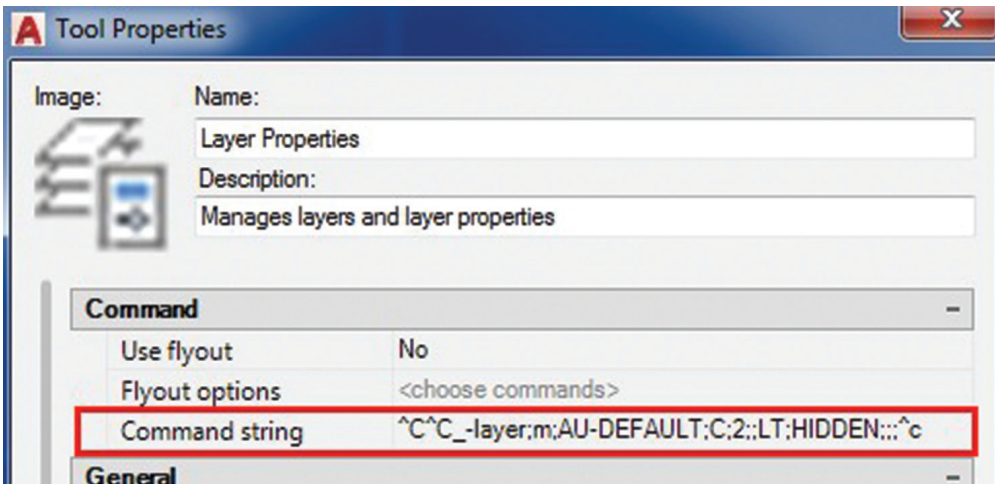

Figure 13

For a video on creating or resetting a layer in AutoCAD with a macro, visit:
https://knowledge.autodesk.com/support/autocad/learn-explore/caas/screencast/Main/Details/3b10818c-52f4-4dff-b7c7-286e2c299fc3.html

RENAMING A GROUP OF LAYERS

You can easily use the rename command to rename a group of layers using the same functionality with wildcards as you did in the layers properties filter. Type rename at the command prompt as shown in Figure 14 and follow the four steps to rename the layers.

1. Select layers.
2. Highlight all the layers you would like to change.
3. Change the wildcard in the first box to C-* and in the second CIVIL-*. This will change all the prefixes of those layers from "C-" to "CIVIL-".
4. Select Rename to:

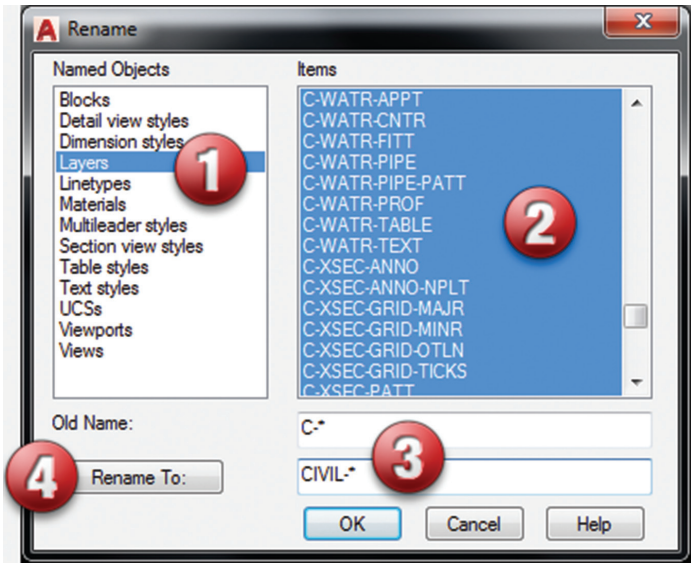

Figure 14

For a video on this topic please visit the AKN for a Screencast: https://knowledge.autodesk.com/community/screencast/43810cee-6129-4193-b43b-86e909c906d2

THE LAYER TRANSLATOR

In the Layer Translator, you specify the layers in the current drawing that you want to change or translate, and the layers to translate them to. The translation maps the layers in the current drawing to different layer names and layer properties in a specified drawing or standards file, and then converts them using those mappings. The Layer Translator is one way to ensure these properties are corrected, and quickly.

VIOLATIONS

1. Incorrect Layer Name (Our standard is to have a prefix of two letters).
2. Color set to "white" and not to "Bylayer" (Bylayer is our standard).
3. Linetype set independently of the layer (Bylayer is our standard).

To solve this problem, I opened up one of our company standard detail drawings and checked all the properties and verified it was completed correctly and, more importantly, to our standard. I then saved the file as an AutoCAD Standards file named MY_COMPANY_STANDARDS.dws. We are saving this to a standards file so we can use it again to check other details against our standard.

Next, open the detail drawing created by the intern. Move over on the Ribbon > Manage Tab and this time select Layer Translator as shown in Figure 15.

You also need to check the layer translate settings by selecting the settings button in the lower left portion of the window. The settings button will control what we want forced onto each layer. This is important as in some instances you may not want one of these items selected.

List of options described from AutoCAD Help:

- **Force Object Color to BYLAYER**
  Specifies whether every object translated takes on the color assigned to its layer.
- **Force Object Linetype to BYLAYER**
  Specifies whether every object translated takes on the linetype assigned to its layer.
- **Force Object Transparency to BYLAYER**
  Specifies whether every object translated takes on the transparency assigned to its layer.
- **Translate Objects in Blocks**
  Specifies whether objects nested within blocks are translated.
- **Write Transaction Log**
  Specifies whether a log file detailing the results of translation is created. If this option is selected, a log file is created in the same folder as the translated drawing. The log file is assigned

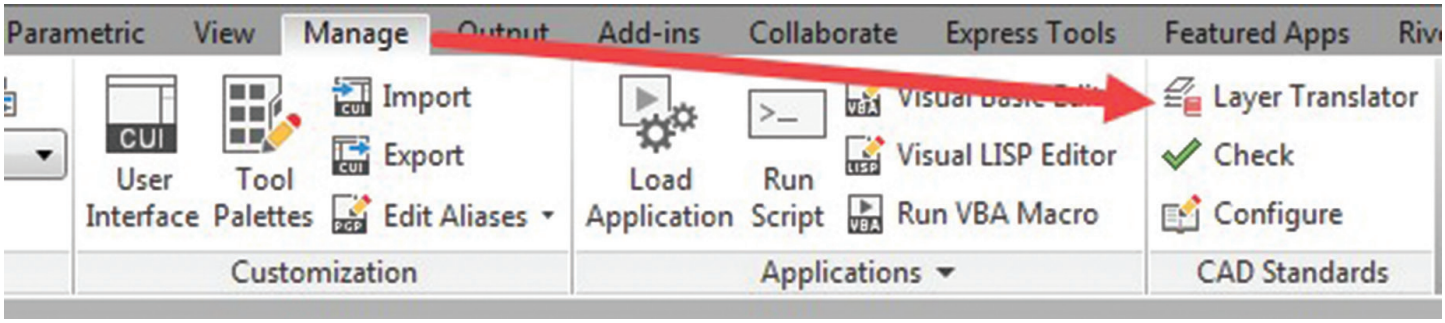

Figure 15

the same name as the translated drawing, with a .log file name extension.

- **Show Layer Contents When Selected**
  Specifies which layers to display in the drawing area.

It's time to map our layers. Figure 16 shows the Layer Translator mapping setting.

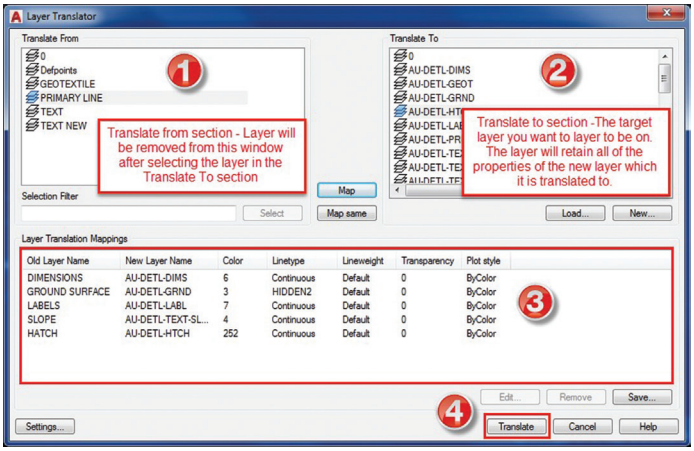

Figure 16

1. The "translate from" section. Take your time and look at the names and properties of the layer you are translating from and verify this is correct. This section shows the layers which are contained within your current drawing.
2. The "translate to" list. This list shows the layers that you loaded from another file or created as part of your standard. You can use the Map Same button to quickly map layers with the same name (that may have different properties).
3. Layer translator mappings. In this area you can see the setting that will be converted after the translation is complete. As you define your layers to map, they are listed in the box at the bottom as shown. You can edit the properties on the news layers using the edit button, remove mapping with the remove button, and save mapping configurations with the Save button.
4. When you are done, hit the translate button in the lower right of the window. Don't worry if you make a mistake—you can save the mapping file and start over.

Your original drawing will be changed per the translations you mapped.

For more information on the layer translator, visit CAD Standards Implementation from Autodesk University: https://autode.sk/2T0ozBa

CONCLUSION

We have only scratched the surface of layers and the tools you need to develop a successful standard to help collaboration within your design team. Layers can help you turn on, off, filter, and display the objects you need to stay productive. Assign default properties to certain layers and lock those layers for better control. Layers help you stay organized within your drawing and provide clear communication to all regarding the purpose of the layer. All these factors play an important role within CAD standards and collaborating effectively at your company. If you start the drawing correctly you will have fewer problems during the later phases of the design process, which will provide a more collaborative approach to how we work.

Sam Lucido is a CAD Services Manager with Haley & Aldrich, Inc. He has more than 25 years of experience involving design, user support, and customization. Sam is an AutoCAD certified professional and an Expert Elite Member. He uses his vast knowledge about AutoCAD and Civil 3D to help provide support to engineering and design teams by holding hands on workshops and online training. Sam is a top-rated Autodesk University Speaker and an AUGI Board Member. You can reach Sam at CADProTips.com or by email at lucido1373@gmail.com.

by: Tony Carcamo

Collaborate in InfraWorks

Collaboration is a crucial part of the design workflow when working on any civil and architectural site project. Collaboration between client, stakeholders, design teams, departments, and offices help keep companies updated with projects milestones, design status, and construction updates.

InfraWorks® has several methods of collaborating data such as exporting the 3D model as an .fbx file format, which in turn can be imported into other 3D modeling design software such as 3ds Max®, Navisworks®, or Revit®. You can also share some of your design data in InfraWorks by exporting to a .imx file format, which can be brought into AutoCAD® Civil 3D®. Because InfraWorks now uses BIM 360® Docs, the cloud model can be shared with other design teams within the BIM 360 Docs platform. Last but not least, InfraWorks model can be shared by using Shared Views. In this article I will discuss how to use Shared Views for collaboration.

SHARED VIEWS

Shared Views is great collaboration tool that allows a designer within InfraWorks to share a visual presentation model to other design teams or clients that don't have a BIM 360 account. With Shared Views, site models can easily be shared to help streamline the approval process during preliminary site design, analysis, and construction phase of a project.

The Shared View feature is located on the utility bar on the top left (Figure 1).

Figure 1

Once activated, the Shared View stack appears. Click the New Shared View button to create a new Shared View (Figure 2).

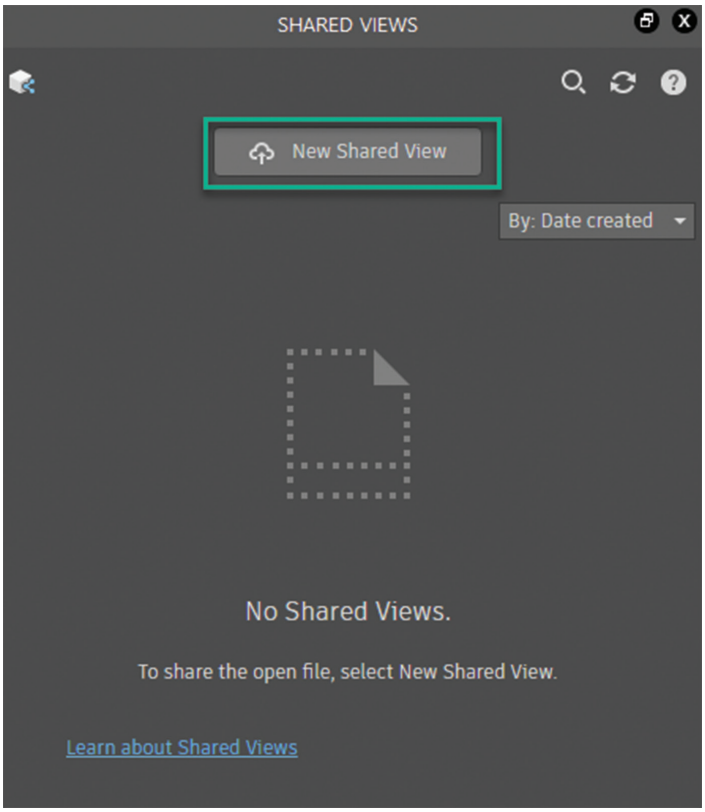

Figure 2

The Create a Shared View dialog box appears. In here you can assign a shared view name, the extents of the model, and bookmarks and properties to be shared. If the model is small, I would recommend selecting the Use Entire Model option. If you want to define the area of your model you would like to share, uncheck the Use Entire Model option. Then use the small pull-down next to the BBox to access the Rectangle or Polygon option (Figure 3).

After clicking the Share button, InfraWorks will spend a few seconds generating and uploading the Shared View. Once completed, the Create a Shared View dialog box appears (Figure 4). From here you can copy the hyperlink webpage to email to other design teams or clients, or you can open the Shared View through the View in Browser option.

When viewing the Shared View model through the browser, the model is displayed with the free Autodesk Viewer web application. You may notice that the model will not have the same rich, high-resolution visual display as the InfraWorks application.

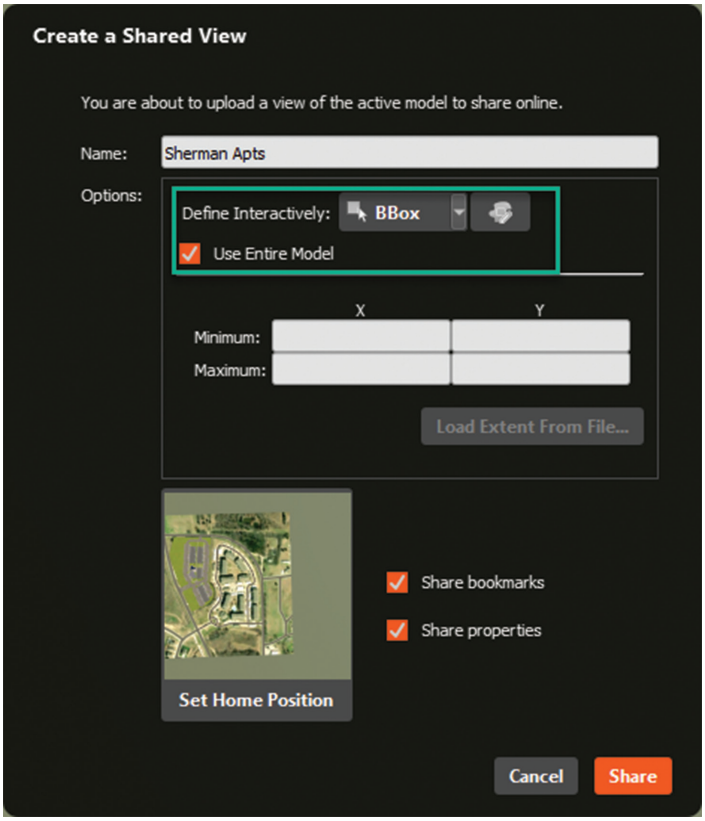

Figure 3

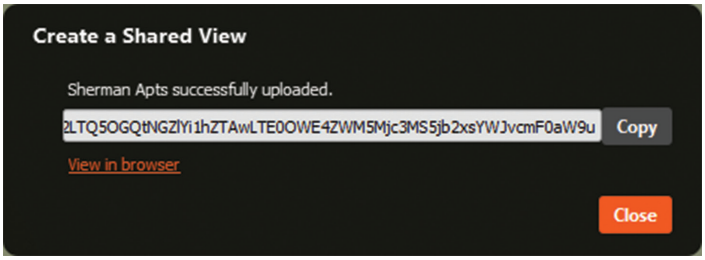

Figure 4

COLLABORATION BETWEEN CLIENT, STAKEHOLDERS, DESIGN TEAMS, DEPARTMENTS, AND OFFICES HELP KEEP COMPANIES UPDATED WITH PROJECTS MILESTONES, DESIGN STATUS, AND CONSTRUCTION UPDATES.

InfraWorks

Figure 5

Navigating in the model through Autodesk Viewer will also be somewhat different than InfraWorks and a bit sluggish. Orbiting can be controlled with your left mouse button. Panning can be controlled with your right mouse button. In addition, zooming controlled could be reversed compared to what you may have set in InfraWorks. The navigation controls can be changed by clicking the Settings icon in the upper left-hand corner of the display screen (Figure 5).

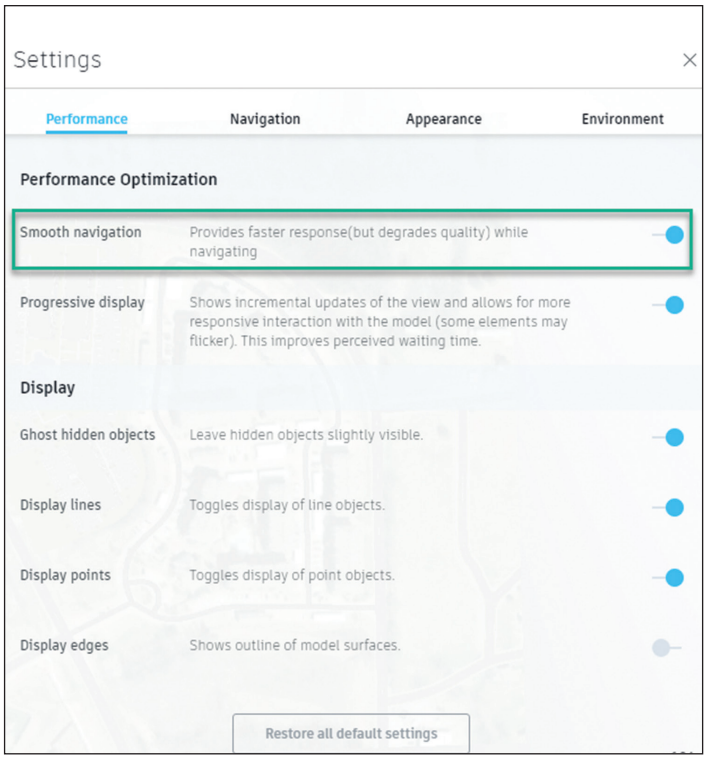

Figure 6

THE AUTODESK VIEWER

The Autodesk Viewer is a free viewer that allows users to view Shared Views models and take advantage of a few measurement, visualization, and collaboration features. Within the Autodesk Viewer, the user can view different proposals, First Person views, and section views. In addition, collaboration features such as markup and comments can also be used to make design changes instantly. The shared view is available online for 30 days, but can always be extended

To improve performance and navigation, I highly recommend going into the Settings, Performance tab and turning on the Smooth navigation option (Figure 6). Then go into the Appearance tab and turn off all visual options (Figure 7).

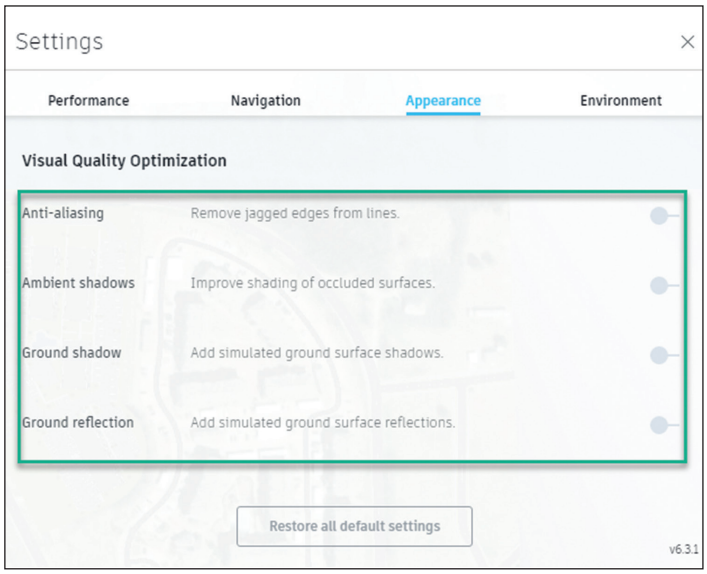

Figure 7

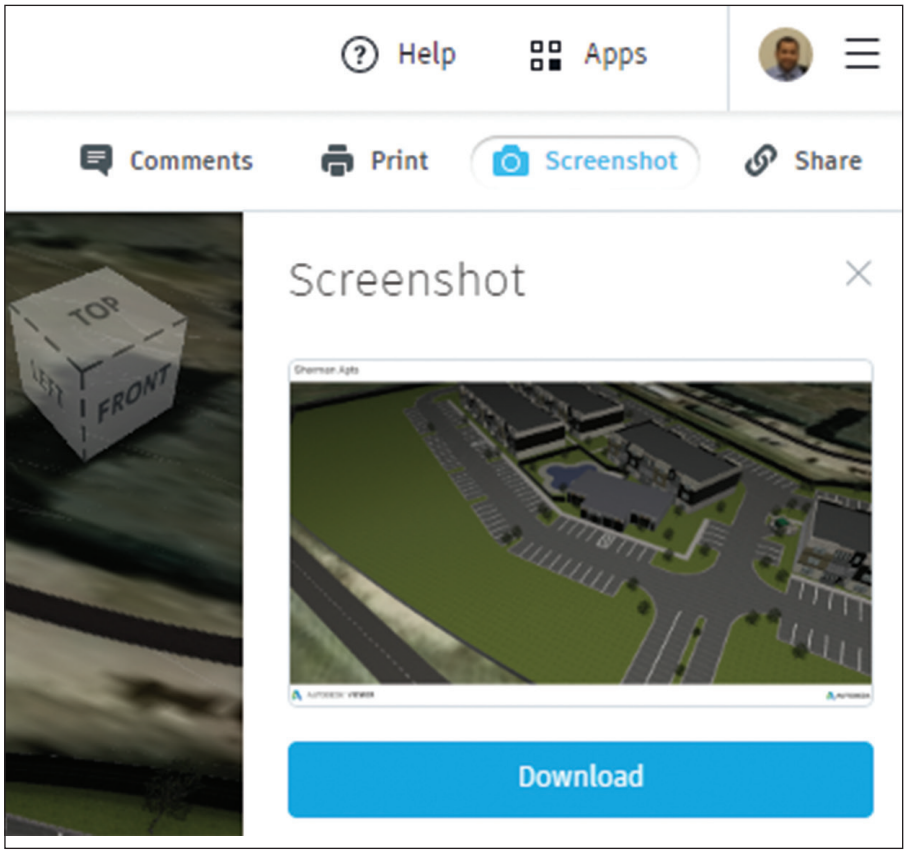

Figure 8

To take advantage of the comment's features, users would need to sign in with the Autodesk Account. At the upper right-hand corners, users can also print or create a PDF of the model view. Screenshots of the current visual display can also be created (Figure 8), downloaded as .png file format.

The Autodesk Viewer also contains a Share feature (Figure 9), which allows the user to share the model with other users with a few control sharing options such as Explode Enabled, Section Enabled, Model Browser Enabled, and Measure Enabled. The shared option feature will create a new browser hyperlink that can be copied and shared out.

To control the visual display of objects such as roads, trees, coverage areas, water areas, and builds, the user will need to access the Model Browser feature (Figure 10).

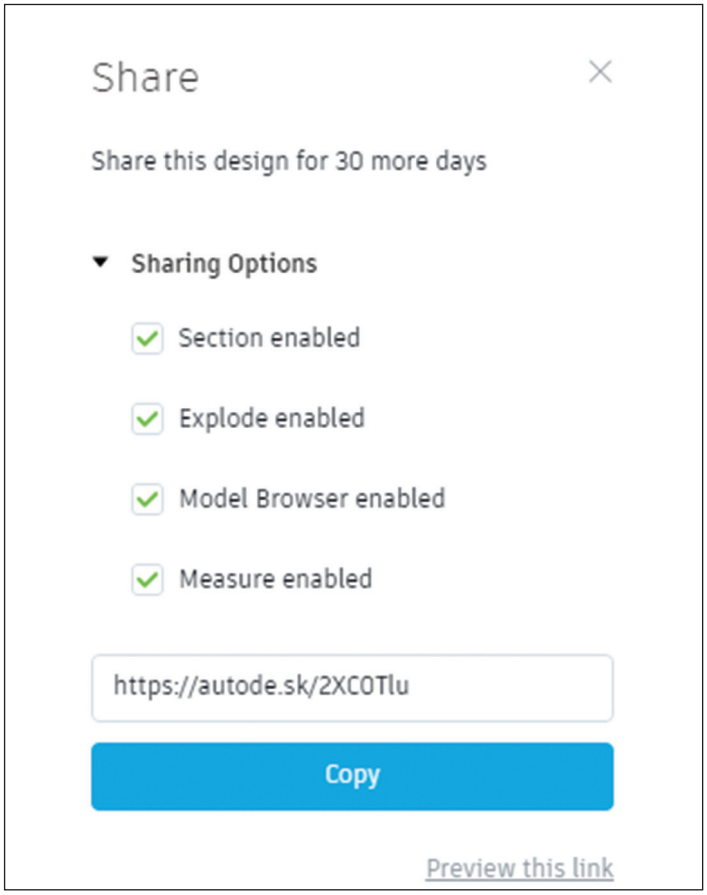

Figure 9

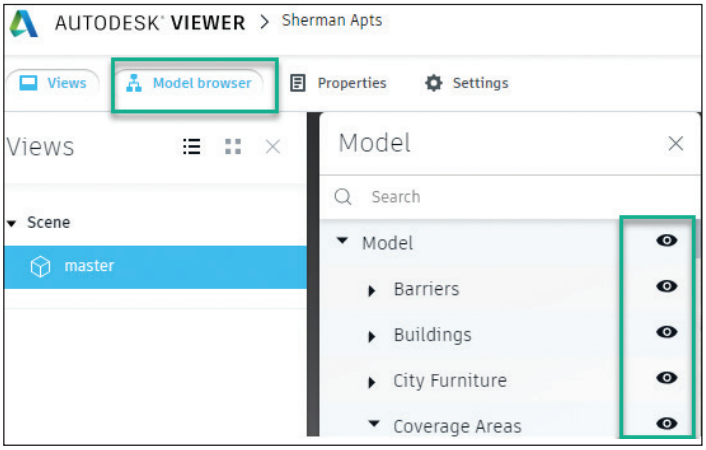

Figure 10

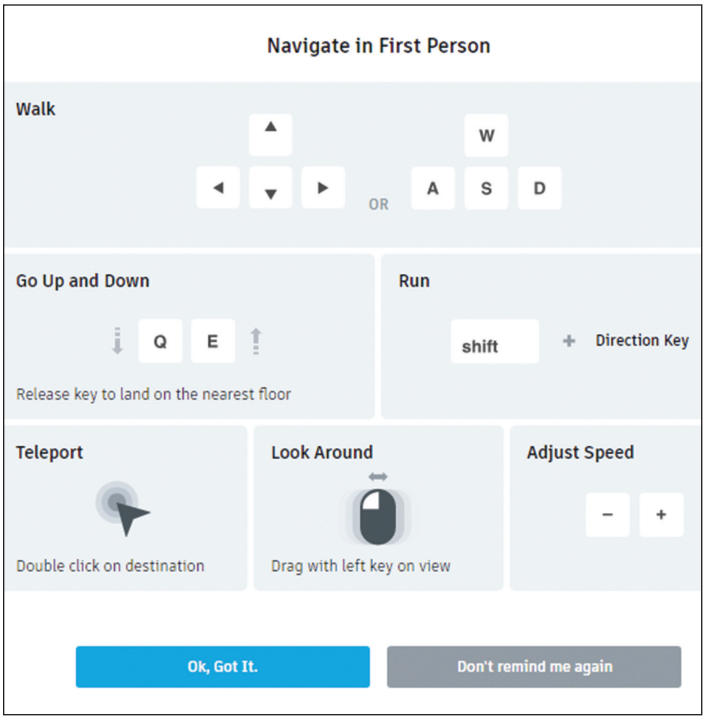

Figure 11

The Autodesk Viewer provides one very cool and unique tool that allows the user to view the model in first person. When activating the First Person feature, you will get a new webpage popup that provides all the navigation controls for First Person view (Figure 11). I think this is a great idea by Autodesk.

Click the "Ok,Got It" button to enter First Person view. Autodesk Viewer will then slowly zoom into your model or you can simply double left-click to teleport to the desired location. I will say that navigating around in First Person is somewhat difficult. It will take some take to get accustomed to the navigation controls. If you get lost or need to just start over, click the Home button on the utility icons at the bottom. I found myself having to do this a few times.

Back in InfraWorks, if you ever need to reshare a Shared View or need to extend the shared date, just click the Shared View icon then within the Shared View stack, click the small three dot

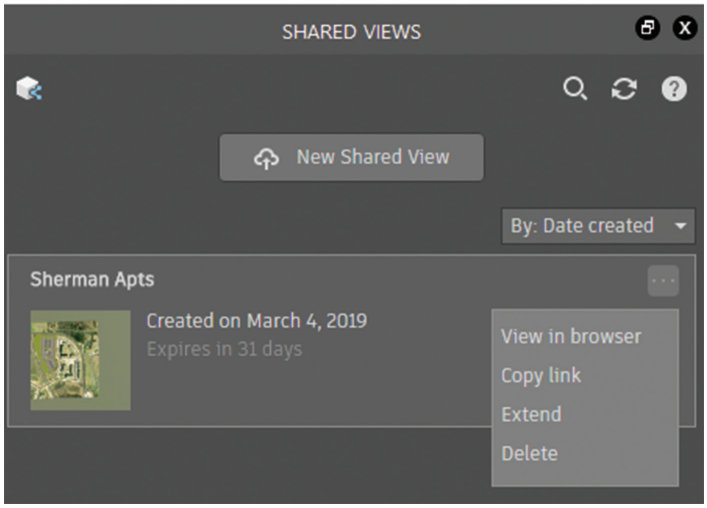

Figure 12

icon. This will provide you access to Copy Link, View in Browser, Extend and Delete and Show Resolved options (Figure 12).

In conclusion, InfraWorks Shared View provides powerful and user-friendly collaboration tools that allow designers to share their 3D models with other designers or clients quickly and easily.

Tony Carcamo is President of Civil CAD Learning Solutions in Dallas, Texas. He has 21 years of experience in the civil engineering field performing different task from surveying, platting to full site, utility and drainage design. In addition, he has 10 years of CAD Management experience with several engineering firms. Tony is also a blogger, on most Autodesk committees and council groups, president of the DFW BIM Infrastructure User Group, certified professional in AutoCAD Civil 3D and InfraWorks 360, and an Autodesk Expert Elite member.

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AUGI

by: Dominique Majon

BIM 360 for Collaboration

It's amazing how the construction industry is unrecognizable from years ago. I remember it as a linear path from negotiation to construction. Everyone had a part to play and was largely only involved with that part. The field had minimal communication with the design team outside of RFIs and submittals. However, as buildings and construction software have become more complex, we find ourselves handling more and more of the overall construction effort for the team. With BIM 360®, this has sent our collaboration effort into overdrive.

For those who have started working on projects that rely on BIM 360, there is a definite change in the way we communicate design intent. On the design side, the workflow formerly relied on what an architect would design and distribute to the rest of the team. This would come in the form of zipped CAD files that were periodically sent out according to the design phase, whether it was design development, bid documents, or addendums and bulletins.

Now, with BIM 360 we can interact with each other more regularly to convey our challenges and ideas to each other. I have seen how the BIM process has changed over the years—from sitting in a conference room with all the other trades for sometimes half a day discussing clashes, to being able to call in from anywhere and address action items as they present themselves.

Figure 1: Remember Buzzsaw?

Although the level of BIM 360 utilization may vary from project to project, for the most part, the design team should have constant access to one another's models. It's important as a BIM coordinator to convey relevant changes to the rest of the team. This puts the BIM coordinators in a position where they can speed up the flow of information to other teammates. Engineers, designers, project managers, and other such individuals will rely on the BIM coordinator, providing up-to-date drawings instead of waiting for drawings to be trickled down and sent back to them. This is how it should be (we do have coordinator in our name, after all!).

That being said, BIM 360 is first and foremost intended as a cloud-based project collaboration tool and is meant for all team members to use as a platform for coordinating with each other no matter where they are located. As such, it provides a focal point for information management and has many tools that provide analytics as well as task management. Now it's easier than ever to even work on our models in the cloud. I think the selling point for me has been BIM 360 Glue. The ability to access the models, clashes, reports, and viewpoints easily has helped to stay on track and focused. Navisworks® is still beneficial to use, however, as it is an easy method to load your model into the saved merged model to make sure there are no problems created by recent work prior to uploading. The last thing a BIM coordinator needs is to solve one clash, only to create two more.

Another tool I have found useful is inserting Navisworks files (NWC or NWD) into Revit®. In the Insert tab there is a tool called "coordination model." Clicking on that icon will open a dialog box where you can add Navisworks files into Revit. The workflow is similar to inserting a linked Revit file. With this method, the most current layouts for all trades can be visible in views.

PRE-PLANNING THE PROJECT

The tools provided by Autodesk have been invaluable for collaboration. We are communicating more than ever, but things can still become slow if proper steps aren't taken at the beginning of a project to ensure its success. Consulting with all trades, getting their perspectives on building layout, and addressing possible challenges ahead of time will cut back on the number of

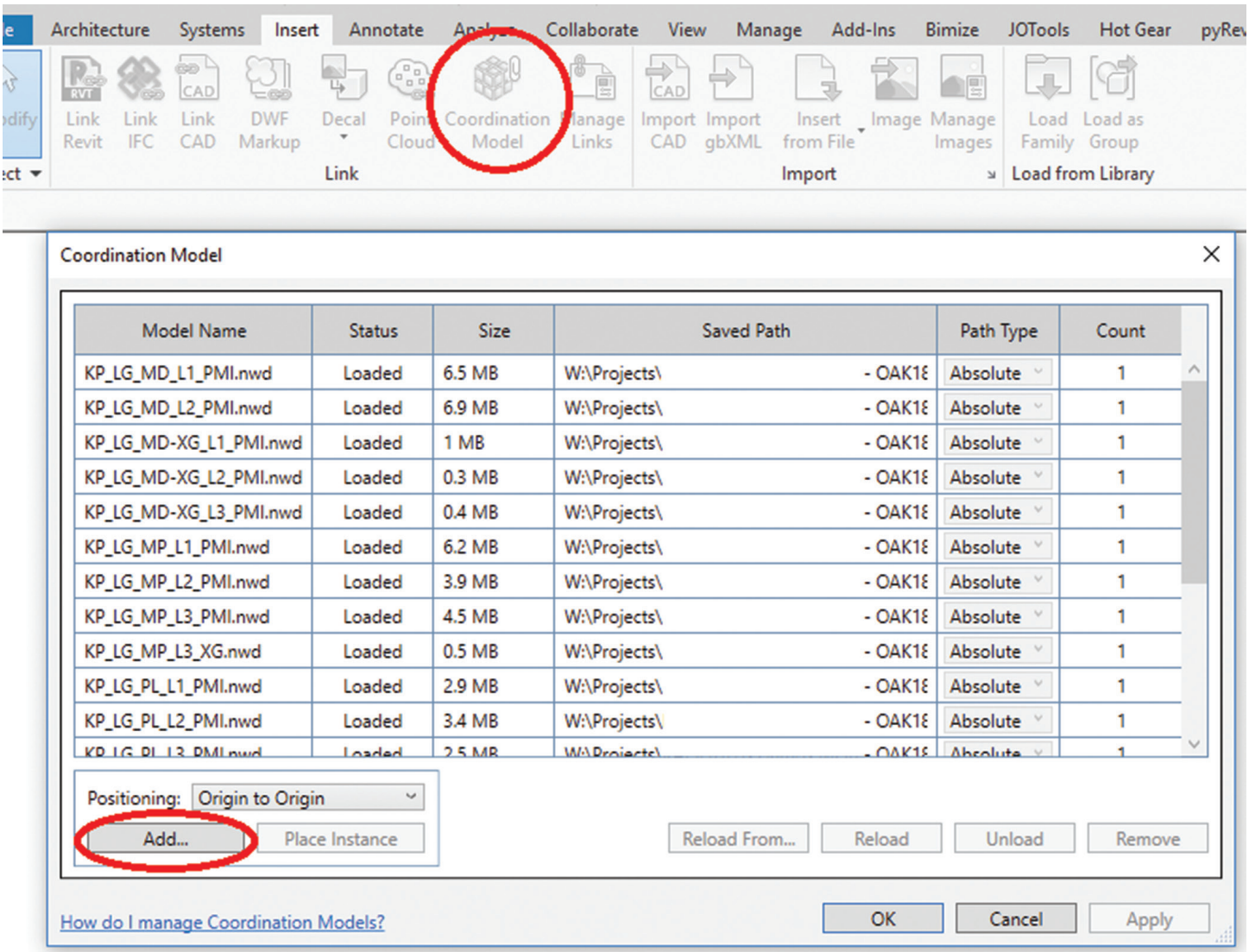

Figure 2: Coordination models

surprises mid-project and will give BIM coordinators an idea of how they should model their trade's equipment. Therefore, there are a few things I've found that need to be examined at the start of a project in order to ensure that the BIM process is smooth going forward.

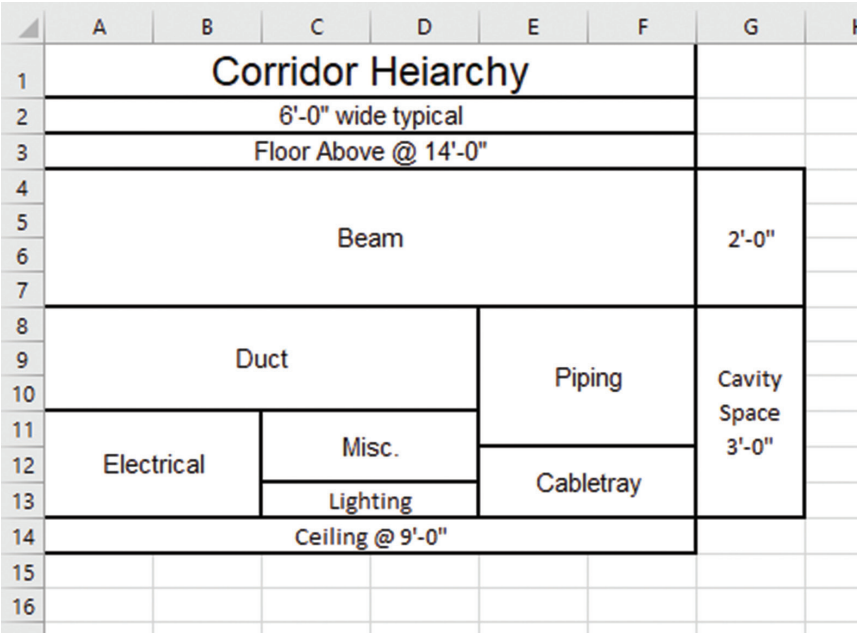

Figure 3: Results may vary

First and foremost is developing a plan for corridor hierarchy. That may sound like preferential treatment, but it is not intended that way. Most MEP pipes, duct, and conduit run in corridors. A planned pathway for the various trades sets a baseline for the BIM coordinator to adhere to. There can always be areas where the location can be switched due to a clash, but setting a designated space for the trades ahead of time will provide a path for the BIM coordinator to take on an initial run of modeling their discipline.

To give an example: cabletray will always need to be accessed from below; therefore, it should always occupy space right above the ceiling, preferably close to a wall with sufficient space for it to be accessed from the side and above. Mechanical, electrical, plumbing, and others should all get a designated spot based on their accessibility. All too often I have worked on a project where this has not been set up initially and each BIM coordinator finds themselves making multiple offsets to get to where they want to go. This takes a while to fix and a solution may be more costly.

For the MEP side, it is imperative for the architect to develop a proper placement of the electrical and mechanical rooms as the floor plan is being laid out. I have dealt with projects where the electrical room had a mechanical chase on one side, an elevator on another, and a plumbing riser room on the third. That left only one wall for all the electrical conduit to exit into the

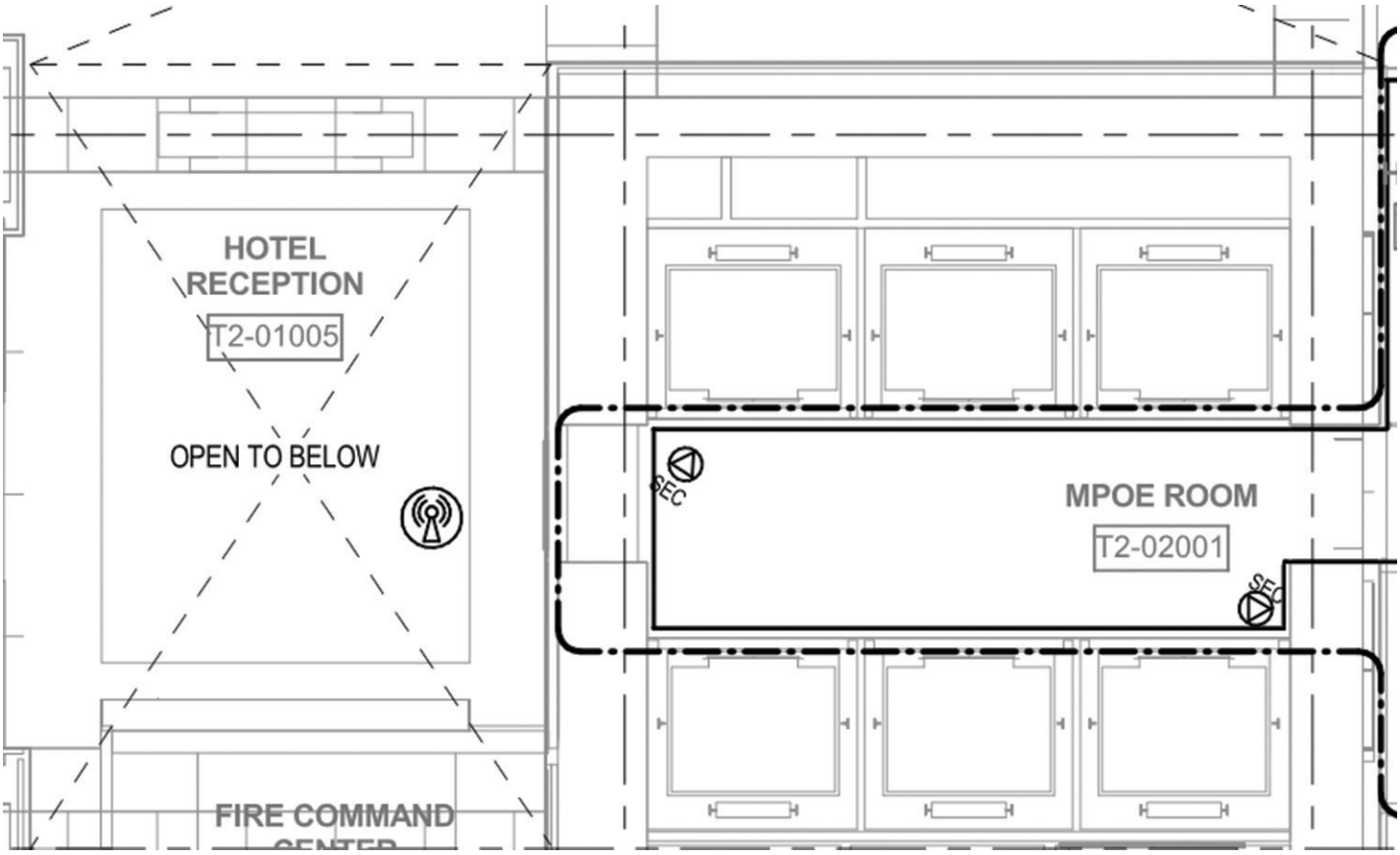

Figure 4: Only one way to go

corridor and go to their destination. Another example is utility rooms that are placed in the corner of the building next to two exterior walls. Obviously, we must work with what we are given, but if these areas were carefully considered at the start of a project, the BIM process would be much faster and provide space for each trade to work around each other.

The same can be said for chases provided for each trade. It is best to come up with a proper space that is accessible from two or more sides. I often see one giant chase being provided for all trades to

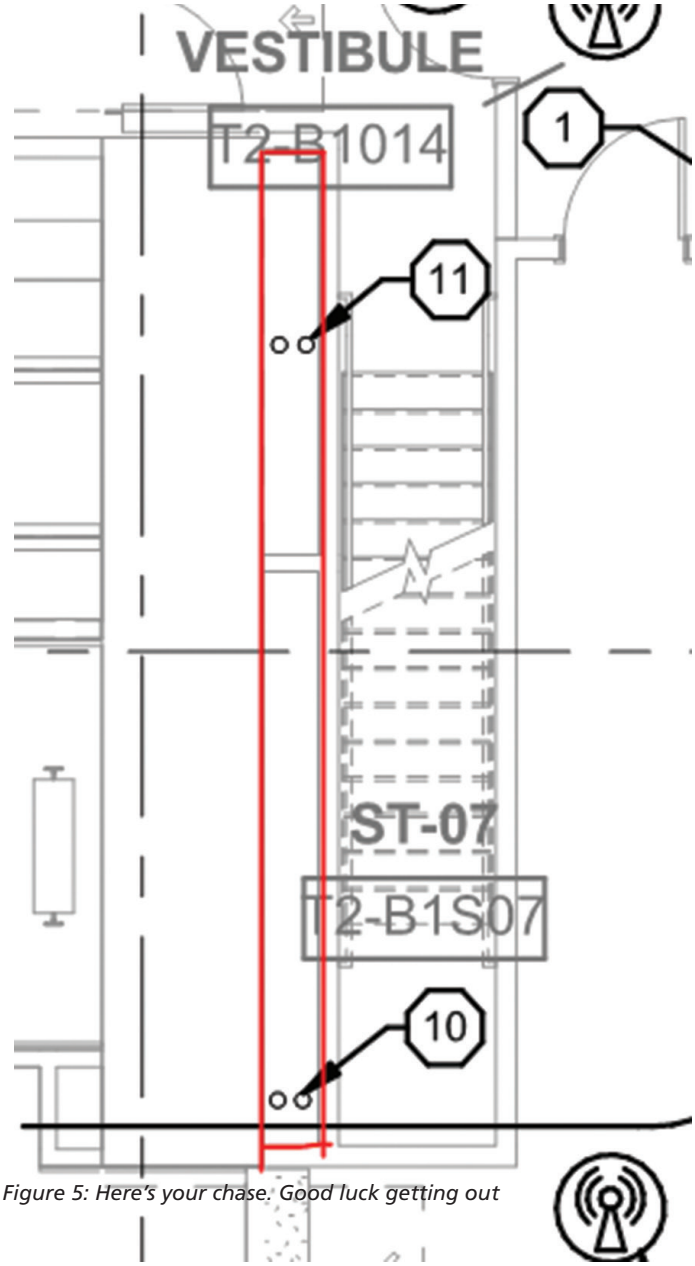

Figure 5: Here's your chase. Good luck getting out

enter and exit. This creates a coordination nightmare as everyone is attempting to make their needed bends in and out of the chase where they may have several rows of piping and conduit. Moreover, an elbow to access ceiling space can be difficult to achieve as the bend radius that is needed for piping or conduit may require a large amount of space.

ALL HANDS ON DECK

It's very important that all trades have input into the project prior to engaging in the BIM process. It creates quite a situation when a trade finally has a signed contract and is ready to start modeling, but the rest of the team is already halfway through development of the coordinated model. If any trade hasn't yet been invited into a project and the BIM process needs to be started, it would be a good idea to provide space for them to use in the future. I can't tell you how many times I've been on a project where a previously unaccounted for trade suddenly has to add their system to the coordinated model. This kind of late addition can become extremely costly.

It is a good idea to ensure all disciplines are accounted for when planning the BIM process on a project. Besides MEP, this can include fire protection, fire alarm, medical gas, vacuum tubing, pneumatic transportation tubing, as well as telecom and all associated low-voltage systems. In addition, if a specific equipment vendor is going to provide structurally supported equipment or needs space that is normally occupied by MEP systems, then they should be invited to collaborate in the BIM process as well or work with their associated trade if a BIM modeler is not available.

Pre-planning is essential before starting the BIM process on any project. This is especially important on projects where an existing building is being refurbished and various systems will be reused. The amount of up-front research and collaboration that is done prior to modeling will pay off that much more for the team in the end. It can be the difference between a project running late and over budget, and a project that is able to meet all the sites' needs in a comfortable timeframe as well as providing valuable cost-saving solutions.

We have the technology we need now to work better than ever as a multidiscipline team. There's no reason for a lack of communication, even if teams are working from separate parts of the world. Just be honest, open, and plan ahead.

Dominique Majon is a BIM coordinator for Guidepost Solutions LLC. He has more than 19 years of experience with AutoCAD and more than 8 years of experience with Revit and Navisworks. Dominique has worked on projects all over the continental USA as well as some projects overseas. His specialty is in electrical, telecom, security, and low-voltage systems design. He has worked on a diverse range of projects including museums, high rises, distribution centers, data centers, retail, and healthcare including hospitals, specialty clinics, and proton therapy cancer treatment centers.