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January 2016

Advice to Help You Advance

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- How to Customize the ACA Environment
- Revit MEP: Views and Visibility
- 3ds Max Interior Scene Construction

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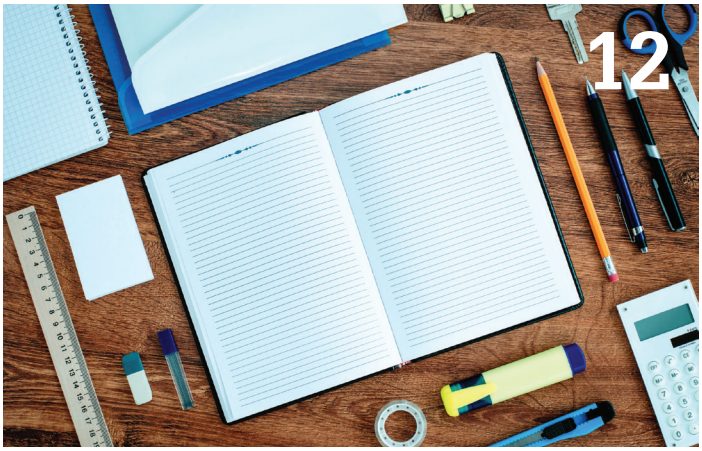

columns

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Letter from the President

MENTORING MATTERS

Recently two of your board members each lost a grandfather. In both cases, the grandfather had a great impact on the life of the board member. The experience, wisdom, and support that these men passed on to their grandchildren can never be fully calculated or measured. We only know that the world is a bit less wonderful without them in it.

As with many things that I observe, this sort of experience can be applied to other things in life.

Let's talk about mentoring. Many of us would agree that mentoring is an important thing to do. All too often we see people hoarding knowledge. There can be all sorts of excuses why they do so. Yet this is not the experienced, wise, or supportive thing to do.

This is also one of the reasons why many of us love AUGI. The sheer amount of knowledge that is shared by the members of AUGI is staggering. Even if you have the misfortune of working for someone who is not good at mentoring you are not left in a void as a member of AUGI. Reach out to your fellow members and seek their experience, wisdom, and support. You may be pleasantly surprised by the depth of the sharing you get from AUGI.

There is also the flip side of the coin. If you have experience, wisdom, or knowledge, then share it! Even if you feel that you have only a small area of expertise, what you know may thrill another AUGI member.

I was reminded of this recently within my own office. I was discussing dual monitor layouts with an experienced Revit support technician who was assisting a user. As part of the discussion I mentioned that the user should drag not only the project browser to the second monitor, but also the properties palette. Not earth-shattering, but the tech hadn't yet suggested it to the user. My next two comments blew the tech's mind: 1) drag some of the ribbon panels to the second monitor; and 2) hold the control key down and drag the Systems tab in front of the Architecture tab (hey, I work in an MEP office!).

The point here is that I offered a few simple tips for rearranging the interface that an experienced user did not know. I didn't consider these tiny nuggets of wisdom all that great, but when I passed on the knowledge to someone else they loved it.

You can do the same. You have all sorts of ways to share, thanks to AUGI. Share it on the forums. Write an article for *AUGIWorld*. Become active as a volunteer or manage one of AUGI programs. Mentor the next generation.

In closing, thank you, Woody and Grover, for the mentoring you did for your grandkids.

R. Robert Bell
AUGI President

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Command and Setting Tips to Help You Advance

The winter of 1991/92 was especially bad where I lived (Nova Scotia, Canada) with record amounts of snowfall. Many people couldn't make it in to work because the snowplows couldn't keep up with snow removal or because school was cancelled every other day, forcing many parents to stay home with their kids.

Somehow, I always managed to make it in to the office.

With no one in the office to feed me work, I had a lot of down time. I took this opportunity to learn as much about AutoCAD® as I could. For Christmas that year, my mother gave me an AutoCAD book called the *AutoCAD Command Reference for Release 11*. It explained every AutoCAD command listed from A to Z, complete with what additional options were available for that command as well as related commands and system variables.

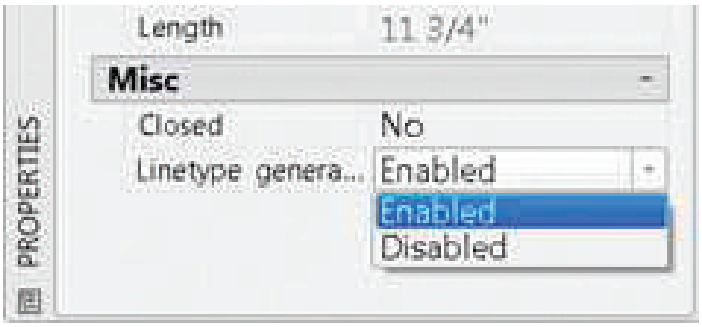
During that winter, I tried to learn the ins and outs of every command from "ARC" to "ZOOM." I attribute this point in time to when I started getting "really good" with AutoCAD. It wasn't hard to do because let's be honest, there were fewer commands back then. Even so, long before toolbars, ribbons, and dynamic input you either used pull-down menus or you HAD to know the commands (back then I didn't care for the pull-down menus).

In this issue, I hope to present some command and system variable tips that might help troubleshoot some problems—or prevent them—which will definitely make you feel like an advanced user.

Note: For even more tricks, please check out the article, "New Old Tricks for Newbies and Old Dogs," which appeared March 2015 issue of *AUGIWorld*.

MAKE DASHED LINETYPES IN POLYLINES LOOK CONSISTENT WITH PLINEGEN

As a CAD user who does civil/municipal type work, I tend to use a lot of polylines for my site plans (e.g., a center linetype for the invert flow of a ditch in plan) and they tend to meander around, forcing the need to have multiple vertices spaced close together. As a result, sometimes the gaps in the "broken" center linetype will not display consistently (i.e., lots of continuous looking lines and hardly any gaps). Within the Properties Manager, you can set the linetype display to "Enabled" to fix it.



To prevent this in the first place, you can set the system variable PLINEGEN to a value of 1, and the broken linetype of your polyline will appear properly as you create it without the need to fix it afterwards.

However, there will be times you don't want the gaps to be evenly spaced. For example, let's say you are drawing the footing outline of a foundation wall as a hidden linetype. You would actually want to see each of the corners have a connection each time the footing changes direction. If PLINEGEN is set to 1, the corners may show as gaps, which gives the impression there are inaccuracies in the footing. Note that this system variable is drawing specific, not global.

CAD FILE IDENTITY CRISIS WITH MEASUREMENT (PART ONE)

For the longest time, CAD users who create drawings using metric measurements had to use some conversion factors to get linetypes and hatch patterns to appear properly on their drawings. For a number of years now, Autodesk has created templates that take metric values into consideration (Hint: template DWT files that have "iso" in their name means they are metric drawings), but a number of people still choose the wrong template to use, and then the linetypes and hatch patterns will not appear properly.

Short of having to recreate your drawing using the correct template, you can use the MEASUREMENT system variable to lend a hand and fix your existing linetypes. The system variable MEASUREMENT only has two setting options: 0 ("zero"), which tells AutoCAD to use the ACAD.lin and ACAD.pat files respectively; and a setting of 1 ("one"), which tells AutoCAD to use the ACADISO.lin and ACADISO.pat files. Once you have set MEASUREMENT to the desired setting, use the command LINETYPE to reload your linetypes, REGEN your drawing, and finally set LTSCALE accordingly. Unfortunately, you will have to edit each scale factor of hatch patterns separately. Tip: change one of them and then perform a "Match Properties" to adjust similar patterns.

CAD FILE IDENTITY CRISIS WITH –DWGUNITS (PART DEUX)

Expanding on the theme of your drawing with an identity crisis, was there ever a time when you tried to INSERT, XREF, or PASTE something into your current drawing file, but the item you were importing was scaled either too big or too small? Even if the UNITS (et. al.) between both the source file and destination file were the same (i.e., millimeters to millimeters, inches to inches, etc.) nothing comes in to the correct scale. Chances are either the source file or the destination file may be having an identity crisis.

To solve this, enter the system variable **–DWGUNITS** (Note: include the hyphen at the beginning), and the following steps will appear:

Command: **-DWGUNITS**

1. Inches
2. Feet
3. Millimeters
4. Centimeters
5. Decimeters
6. Meters

Unit for length <3>:

Drawing unit display formats:

1. Scientific
2. Decimal

Linear display format <2>:

Linear display precision <4>:

Scale objects from other drawings upon insert? [Yes/No]: N

As you see in the first three steps, you set the values accordingly, but take note of the last option to scale objects upon insertion. The best bet is to always answer "No" to this option, but you may have to experiment.

So what's going on? The short answer is, "Vertical Applications." If a drawing was created or even just opened and saved by a vertical application other than AutoCAD, whatever the UNITS were set to in the vertical application when the drawing was saved will override how the units are/were set in regular AutoCAD.

Once **–DWGUNITS** are set properly in both the source and definition files, objects being imported into the destination file will work properly.

THE FOLLOWING PREVIEW HAS BEEN APPROVED BY EVERY CAD USER

For a number of releases now, AutoCAD has had the ability to set the Layout tabs to a WYSIWYG ("What You See Is What You Get") format so that you don't have to take the time to do a "Plot Preview." However, there are still a lot of people who turn this feature off because they may find it distracting during the design process, but will do a Plot Preview at a later date. For those of you who do this, here is a simple method to eliminate one of those steps. Instead of entering the PLOT command and clicking the "Preview" button, all you have to do is enter the command PREVIEW and you will instantly get a preview of how your drawing will plot as a hard copy based on your current plotter/printer settings.

SAVE YOUR DRAWING WHEN QSAVE WON'T SAVE

Have you ever encountered the error message: "*Filename.dwg has a command in progress*"? You'll discover no matter what you do, whether it be clicking the QSave icon, entering Ctrl-S on your keyboard, or even entering SAVEAS, you get the "*…has a command in progress*" error.

Sometimes, even trying to close the drawing without saving won't work.

Try entering the SAVE command at the command line instead. I can say from personal experience this method works.

DUPLICATE A BLOCK DEFINITION WITH BSAVEAS

In the old days, if you wanted to duplicate an existing block definition that required subtle differences, the method was to INSERT the block, EXPLODE it, make the unique changes to its geometry, and then define a new block. This method worked well, but in the advent of Dynamic Blocks, this method became a problem because once you exploded the block, it would lose its Dynamic Properties.

So, to duplicate a block definition without destroying its Dynamic Properties, first use the BEDIT command to open the desired block in the Block Editor to duplicate in your current drawing. Then before making any modifications, use the BSAVEAS command and save it as a new block name when prompted.

Take note that once you define the new block name, you will still be in the block editor environment and editing the new block you just created. The block definition you originally opened is still safe and sound. Now simply make the desired changes and exit the block editor accordingly.

A SORBET OF COMMANDS TO CLEANSE THE PALETTE

The addition of tool palettes has been a part of AutoCAD's (et. al.) interface for a number of years now. However, some of us still like using the "old fashioned" dialog boxes—some for personal reasons, others for performance reasons.

Whatever the case, below is a list of commands and system variables that help turn off the palette for certain functions in order to use its dialog box equivalent.

CLASSICIMAGE (command): This command lets you attach and detach image files in a dialog box designed specifically for managing image files (i.e., no xrefs or pdfs, etc.).

CLASSICXREF (command): This command, like the CLASSICIMAGE command, allows you to manage external reference files (aka XREFs) in a dialog box designed just for XREFs.

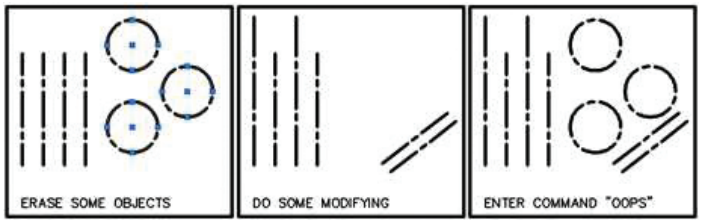
CLASSICLAYER (command): As with the previous two commands listed above, you will get a dialog box to manipulate layers. Another option is to set the system variable LAYERDLGMODE to a value of 1, and the LAYER command goes from using a palette interface to that of an old fashioned dialog box.

HPDLGMODE (system variable): With this system variable set to a value of 1, you will get to create your hatch patterns via a dialog instead of a palette.

Note that using the dialog box versions of these commands has all the same features and functions as its palette counterpart.

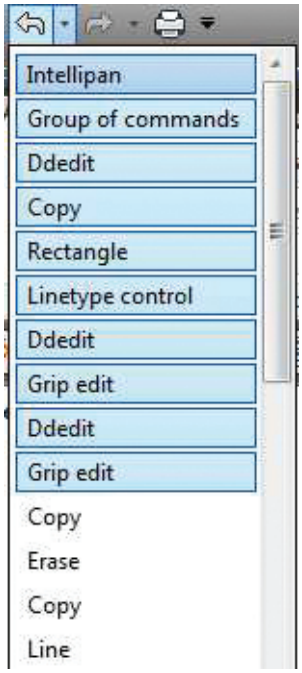
OOPS, I DID IT AGAIN!

Yes, believe it or not, there is an AutoCAD command called "OOPS." How many times while editing a drawing file have you erased a selection of objects only to discover later that you needed them after all? Traditionally, when someone realizes they needed those objects, they will repeatedly use the UNDO command until they get back to the point during their editing session before they erased the objects. Instead of losing all that time and effort, try using the OOPS command. This will bring the last set of objects that you erased back into your drawing in the spot from where they originated without affecting the rest of the drawing. Please keep in mind that OOPS only brings back the very last set of objects you deleted.



DO UNDO TO YOU

Speaking of the UNDO command, there will be times when you will need to UNDO several steps to get back to a certain point during your editing session. Instead of entering the UNDO command and then pressing the '*Enter*' key over and over again to repeat the command in order to get back to that particular point, you can do one of two things:

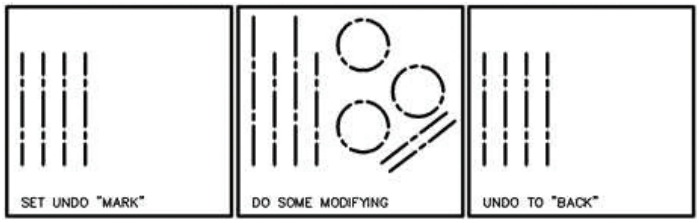


First option: Look at the UNDO icon on the Quick Access toolbar. You should see a small pull-down menu arrow, and if you click on it, a pull-down window will appear listing all the commands you recently used up to that point. Simply select the particular command that you want to UNDO to, and your editing session will undo everything back to that point.

Second option: An UNDO trick that goes way back is you can enter

the specific number of steps to UNDO. Simply enter the UNDO command, and then enter a desired number (e.g., 20) and the UNDO command will then undo the last 20 commands.

Bonus Tip: There will be times when a user just knows they may need to UNDO the next several editing steps in case what they are creating won't work. You can actually pre-set the UNDO command before you continue on with your work. Simply enter the UNDO command and enter the letter "M" for "Mark" which acts as a placeholder. Then create and modify objects in your drawing as you normally would, and if you realize the results are not what you were hoping for, enter the UNDO command again and enter the option "B" for "Back," and everything you did will be undone back to the point where you assigned the "Mark" placeholder. The nice thing about using the "Mark" option is that undoing goes a lot faster, and you prevent accidentally undoing further back than you desire.



ACTIVATE GRIPS OF LAST SELECTION OF OBJECTS WITH PSELECT

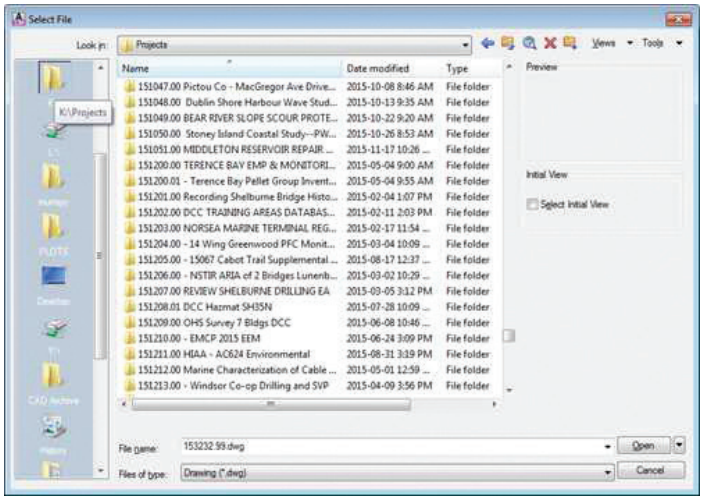
I'm a huge fan of manipulating objects using GRIPS because it saves time when editing an object (e.g., Stretching an object's endpoint with its grips goes quicker than using the STRETCH command). It's also productive to manipulate the grips of several objects at once with their grips activated. However, if you press the "Escape" key to cancel the active grips of the selected objects, it can be time consuming to reselect the same objects if you need to manipulate them again. If you want to reactivate the grips again of the previous selection set, simply enter the command PSELECT, and when prompted, enter "P" for "Previous." The objects you were previously manipulating will again be activated with its grips.

CREATE SHORTCUTS TO DRAWING FOLDERS WITH THE OPEN COMMAND

Over the years, Autodesk has created several ways to open your drawings quickly (e.g., double-clicking a drawing file, drag-n-drop a drawing file, pinning drawing files to the taskbar, etc.), but many users are still content with just using the old fashioned OPEN command. However, these users will attest that it can take time to navigate through your company servers to find the right project folder on the right designated drive. For example, a company may arrange its servers with several drives and folders in order to arrange them for specific tasks (e.g., active projects, archived projects, branch office servers, etc).

The following trick allows you to manipulate the OPEN dialog box to make it quicker to navigate your server.

While in AutoCAD, enter the command OPEN like you normally would, and navigate to a folder on your network that you constantly need to access. Then, right-click in the left-hand pane of the dialog box and select the menu option "Add Current Folder." A shortcut to that folder will now reside in the navigation pane of the OPEN dialog box. You can also change the shortcut's display name by right-clicking on it and selecting "Properties."

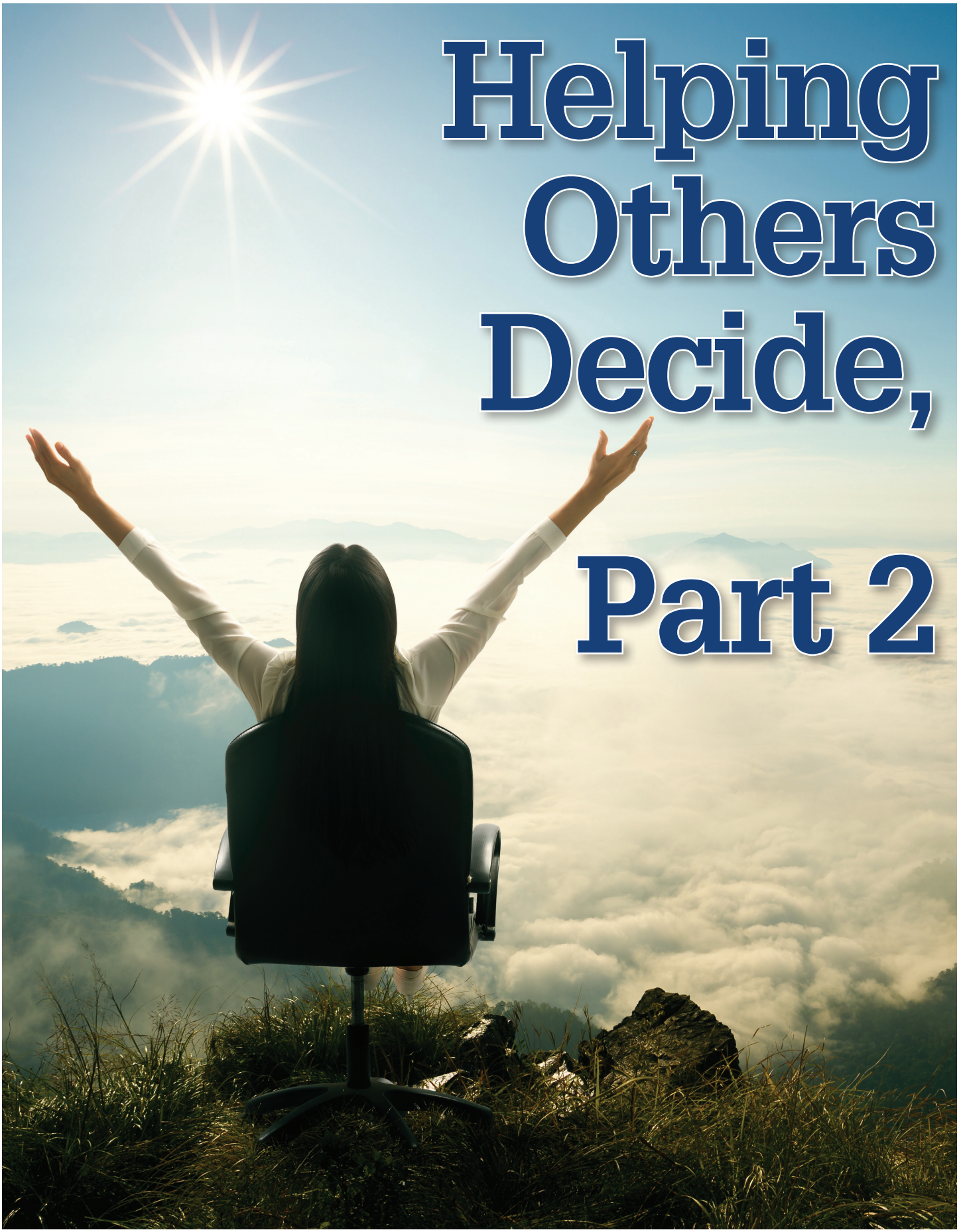


Here's an additional trick. I typically work with several engineers at any given time on numerous projects, and remembering which project belongs to which engineer can be a challenge. To solve this, I created a number of folders to host shortcuts for every engineer's projects. First, I create several blank folders and name it for each engineer I work with. Then, I create shortcuts within the folders for each corresponding engineer's projects. And finally, as outlined above, I create a shortcut to each of my engineer's folders within the navigation pane of the OPEN dialog box. Within the OPEN dialog box, I am literally only two navigation clicks away from getting to a desired project folder.

Please note you may notice a performance drop in case the shortcuts become invalid, so be diligent when managing your shortcuts.

Murray Clack is the CAD Systems Coordinator for CBCL Limited, a consulting engineering firm in Halifax, Nova Scotia, Canada, and has been using AutoCAD for 23 years. He has had articles published in various industry magazines and has submitted tips and routines to CADalyst *magazine's "Hot Tip Harry." Murray recently provided consultation to Autograph Technical Service for the metric version of their CadCARD Slide Chart product.*

Helping Others Decide, Part 2



CAD Manager

In the December issue I introduced the idea that leaders need to be good decision makers and also help others make good decisions. Here are the general decision making environments or categories that might impact others who are trying to define a direction for movement:

- Easy and Obvious – often thought of as "no brainers"
- Complicated but Known – many moving parts, but all are evident
- Complex and Unknowns – many undefined areas that are unpredictable
- Chaotic and Unknowable – many decisions to make, no facts, no time to think

We discussed the first two and now move on to the last two. If you need a refresher or missed the last article, I suggest you take a look at last month's column.

COMPLEX DECISIONS

Complex environments are those with many moving parts, like the complicated framework we discussed before, but there is no obvious connection between cause and effect. There are few patterns of behavior in systems or people. It is unpredictable on the surface. There is no definitive solution like a complicated environment might have. There are many competing solution ideas and options in front of you, none of which garner consensus agreement from those involved. There are areas where you are unaware of what you do not know. Relationships between components are not defined and seem random.

Helping those you lead may include a focus on the following:

Look for patterns. Encourage the search for patterns (If we do this, this happens. If we do that, this does not happen). That is simplistic, but gives you an idea of patterns. If there are no patterns, then set up experiments and environments that allow patterns to develop. Complex decisions may present very subtle patterns. Strive to have others see the patterns that lead to conclusions. Once patterns emerge, options can become clarified. If all roads seem equal, start down one and see what happens.

Talk more. Keep conversation going among teams and people. Help others talk it out. Ask more questions. Go down multiple rabbit trails. Search for more ideas and don't count anything out. The more discussions happen, the more opportunities arise to see patterns and options that may have gone unnoticed.

Command and control won't work. Do not encourage someone to just give orders or force structure into chaos. This usually fails. It may make the person feel like they are in charge, but most often the complexity of the problem does not favor just plowing forward and not being reflective. If the person over-controls the situation, you may not have the opportunity to see patterns emerge.

Take your time. Do not rush the process when things appear complex. Don't give up too soon and pick a random option. Patterns may take time to be unearthed and may take time to decipher. Options may become clearer only after extended discussion or thought.

CHAOTIC DECISION MAKING

Chaotic environments are those with high levels of turbulence. They are like the complicated or complex frameworks we discussed before, but they appear to be constantly changing and never stable. Nothing remains that same and there is unpredictability about cause and effect. They contain unrepeatable processes that might help define outcomes. You cannot "break it" on purpose to see what happens. They contain random problems or results with infrequent and scattered repetition. There is a problem, but there are no obvious trails to go down to find the answer. What works appears to be a random list that changes. Some things remain unknown. You just can't figure out which option is best, or why things are not working consistently. Fixes work for short periods and long-term solutions seem out of reach.

Separate the chaos from the fire. Chaos and crisis often look alike. Tech Managers have to operate as first responders a great portion of the time. Things break. Projects veer off course. Software does not cooperate. Chaos differs from crisis, in that a crisis needs to be fixed now. In a crisis, there is no time for discussion (see sidebar).

> Chaotic environments are those with high levels of turbulence.

Bring calm. When chaos erupts, many get flustered and a calming influence may be the best first step to avoid crisis. The demeanor of the decision makers will impact everyone and they need to have their wits about them.

Command and control might work. In the early stages, just taking action brings comfort. Failing to act makes folks think that the decision maker may have no clue about what needs to be done. Even moving tasks and people into key roles is progress. Positioning staff for action might start the process moving. Nudge the decision maker toward staging people to make some easy progress and then…

CRISIS MODE: DECISIONS UNDER PRESSURE

Much of the time, CAD managers are called on to "just fix it." Something is failing and project teams feel as if they are careening out of control and heading toward disaster. No one can figure it out and there is no time to analyze and research the issue. It might be hardware or software failure, corruptions, lost files, or so much more.

When the stakes are high and time is fleeting, take these steps and focus on action.

Show me what happened. Ask those involved to show you the processes they used that caused the problem. Tell them to show you, not just tell you. They should be the hands-on driver and not you. Many times people say they have done one thing when they actually, unknowingly, have done another. This process may help find a misstep or indication of the problem's origin.

Tell me what changed. Ask what changed. Sometimes another system, process, or platform has changed. Sending final plots to a printer that was not previously used; a change in the configuration of their local PC; or maybe an upgrade to the software that was automatically completed (think Adobe).

Trial and error is okay. Try out some solutions that you think might make progress. As you experiment, monitor solutions. Keep track of what starts working and what made no difference at all. Move past the items that make no impact and track down the solution by process of elimination.

Abandon ship. Move to another computer, server, plotter, or software tool. Get creative. There are many ways to get a plot out the door. There are many ways to exchange files with contractors. When the crisis has passed, move back to defining the long-term fix.

Don't worry about the root cause (for now). The point in a crisis is to get beyond the heightened level of concern as quickly as possible. Discovering the root cause of a problem may not be the most pressing item. If you can get things working again and go back to it, then that might be the best approach. If you have a solution, there may be no immediate need to uncover the original issue. Go back to it later.

Move from chaotic toward easy. The goal is to have staff that needs to make decisions move the framework farther down the line from chaotic to easy. Make methodical and measured progress. Some decisions will not move to a more simplistic approach, but most will. Just moving from one level to another will make decisions easier on your people. If you cannot move the entire discussion to a less chaotic state, then try to find the simplest components of a decision and work toward stabilizing the chaos. As things become easier, move away from command and control measures and let the team start participating in next steps.

Keep people informed. Have the deciders be ready to answer "what is happening?" questions and give information prior to being asked. Have them lay out the steps they are taking even if they do not know the end game plan. Keep the communication flowing.

Debrief after the turmoil subsides. Once the environment gets past critical mode, have the decisions reviewed to see if adjustments need to be made. Things that worked in a pinch may not be long-term corrective actions. Advise a full review after the dust settles.

CONCLUSION

By adjusting your advice depending on the situation, you can help others apply the best approach for deciding a course of action. Understand that what appears to you as easy might look complicated to others. Apply the right methodology to the right level of their concern, not yours. Support the process that others are using to make good decisions and get them through the current situation, then help them to be prepared for the next time. By passing on some lessons learned and advising others on how to think through a problem, you can help them avoid an easy decision inflating to chaos or even crisis.

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.

by: Melinda Heavrin

The Customize User Interface (CUI) of AutoCAD® Architecture allows you to tailor your drawing environment to suit your needs. Before you start customizing your own menus, toolbars, and workspaces, you should familiarize yourself with the customization environment.

Open the Customize User Interface Editor by clicking the Manage tab of the ribbon, Customization panel, and then User Interface (see Figure 1). Once you have opened the Customize User Interface (CUI) Editor, you can view the contents of the loaded customization files by expanding the elements in the tree structure and viewing the properties of the elements by selecting them. You can also select the Transfer tab to see how to migrate or transfer customizations, and the Customize tab to see how to create or modify user interface elements. Once you are familiar with the environment, you can start to take advantage of the capabilities of the tools.

Let's take a look at some of the great customizations that can be performed in the CUI in AutoCAD Architecture. Since there are so many possibilities, we will concentrate on workspaces, toolbars, and commands for the purposes of this article.

CUSTOMIZING WORKSPACES

The Customize User Interface Editor allows you to create or modify workspaces that have precise properties associated with the application and drawing windows, as well as user interface elements

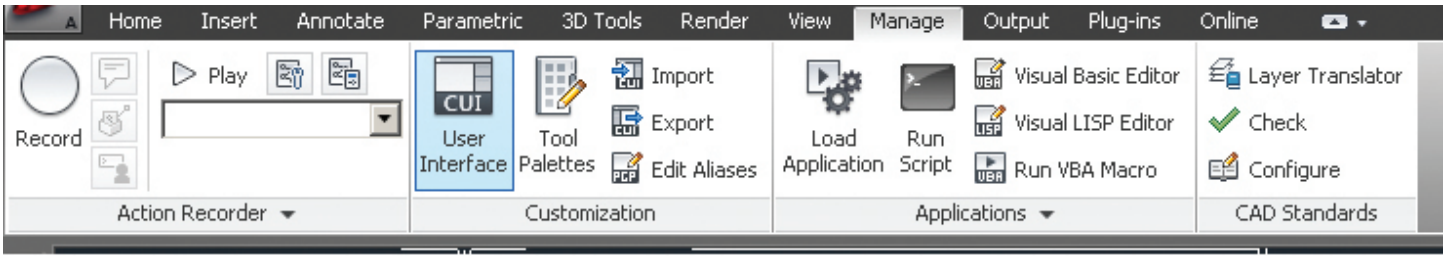


Figure 1: Customize User Interface

(toolbars, menus, ribbon tabs, and palettes). You can customize a workspace by selecting a workspace from the Workspaces node in the Customizations In pane. The Workspace Contents and Properties panes will be displayed.

If you wish to create a new workspace, begin by clicking the Manage tab of the ribbon, Customization panel, and then select User Interface. In the Customize User Interface Editor, Customize tab, in the Customizations In <file name> pane, right-click the Workspaces tree node and select New Workspace (see Figure 2). A new workspace (named Workspace1) is now placed at the bottom of the Workspaces tree node. Next, enter a new name over the default name Workspace1. In the Workspace Contents pane, click Customize Workspace (see Figure 3). In the Customizations In <file name> pane, click the plus sign (+) next to the tree nodes to expand them. Click the check box next to each user interface element that you want to add to the workspace. The selected user interface elements are added to the workspace. In the Workspace Contents pane, click Done and then click Apply.

The new workspace you have created can be set as the default workspace. To do this, click the Manage tab of the ribbon, Customization panel, and then select User Interface. In the Customize User Interface Editor, Customize tab, in the Customizations In <file name> pane, click the plus sign (+) next to Workspaces to expand it. Right-click the workspace you want to set as default and select Set Default then click Apply. It is important to note that in the Network Deployment Wizard, the main and enterprise CUIx files can be specified. If the main CUIx file has a default workspace set, that default workspace will be set as the current workspace when the file is loaded into AutoCAD Architecture for the first time.

If you wish to modify an existing workspace, you can do this by clicking the Customize Workspace button in the Workspace Contents pane. After you do this, the Customizations In <file name> pane lists the user interface elements that can be added to the workspace that is currently being modified. Check boxes are displayed next to each user interface element in the loaded CUIx files. You use the check boxes to add or remove user interface elements from a workspace.

You can use the Transfer tab of the Customize User Interface Editor to import a workspace to the main CUIx file. Workspaces that are in partially loaded CUIx files must be transferred to the main CUIx file if you want to set that workspace current. To import a workspace to a main CUIx file, begin by clicking the Manage tab of the ribbon, Customization panel, and then select User Interface. The Transfer tab is displayed, with the main CUIx file displayed in the Customizations In <file name> pane (left side). In the Customize User Interface Editor, Transfer tab, in the Customizations In <file name> pane (right side), select the Open Customization File button. In the Open dialog box, locate and select the customization file that contains the workspace you wish to add to the main CUIx file. In the Customizations In <file name> pane (right side), drag the workspace from the CUIx file to the Workspaces node of the main CUIx file in the Customizations In <file name> pane (left side) and click Apply.

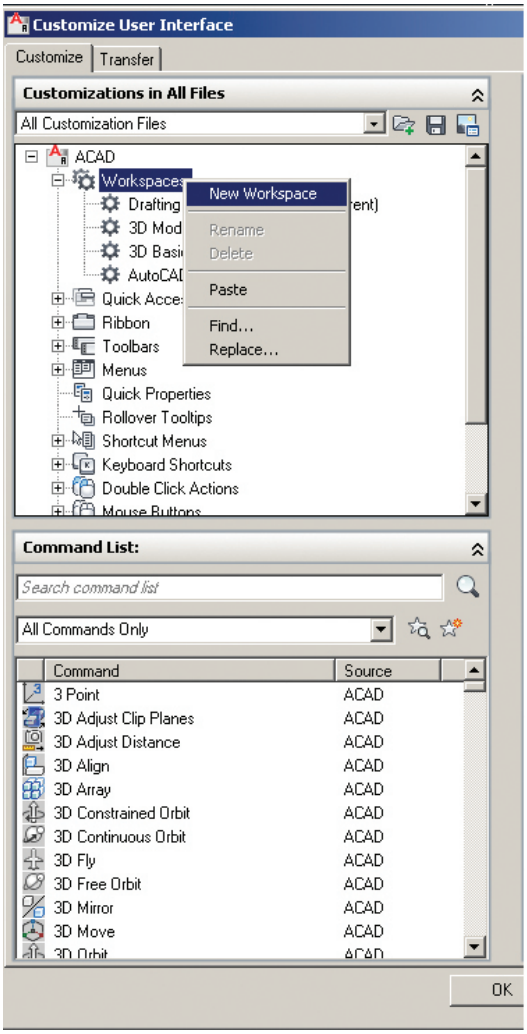


Figure 2: New Workspace

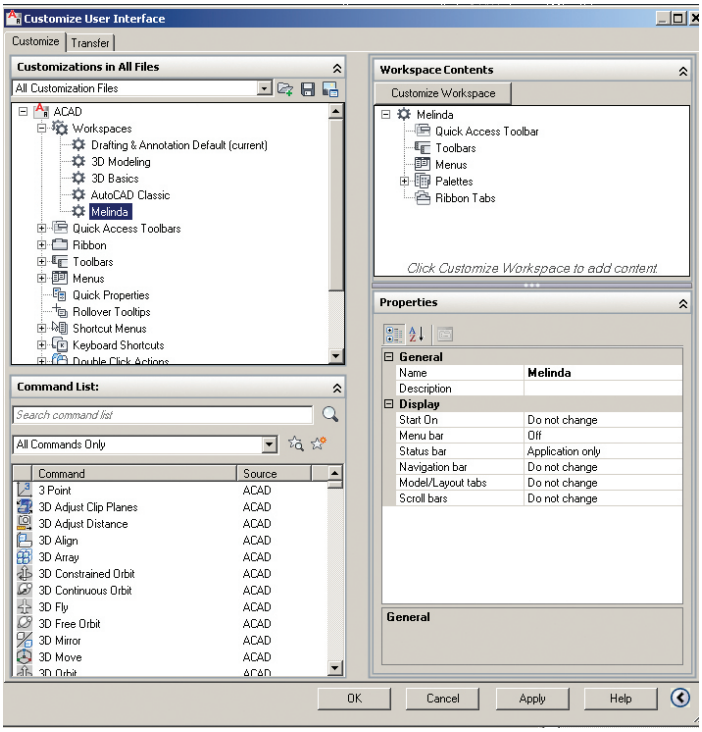


Figure 3: Customize Workspace

AutoCAD Architecture 2016

CUSTOMIZING TOOLBARS

Simple toolbar customizations can make your daily drawing tasks much more efficient. For example, you can consolidate frequently used commands and controls onto one toolbar to give you a "one-stop shop" for all your drawing needs. You can even create your own toolbars and flyout toolbars. You can also create a toolbar from scratch, create a copy of an existing toolbar, or create a toolbar from an existing pull-down menu. Please note that submenu items are not included when a toolbar is created from a pull-down menu. By default, a new toolbar is displayed in all workspaces.

To create a new toolbar, begin by clicking the Manage tab of the ribbon, Customization panel, and then select User Interface. In the Customize User Interface Editor, Customize tab, right-click Toolbars in the Customizations In <file name> pane. Select New Toolbar (see Figure 4). A new toolbar (named Toolbar1) is placed at the bottom of the Toolbars tree. Next, right-click Toolbar1 and select Rename. Enter a new toolbar name. Now select the new toolbar in the tree view and update the Properties pane. In the Description box, enter a description for the toolbar. In the Default Display box, specify if the toolbar should be displayed by default when the CUIx file is loaded as a partial customization file. In the Orientation box, specify the orientation of the toolbar. In the Default X Location box, enter a number. In the Default Y Location box, enter a number. In the Rows box, enter the number of rows for an undocked toolbar. In the Aliases box, enter an alias for the toolbar. In the Command List pane, drag the command you want to add to a location just below the name of the toolbar in the Customizations In <file name> pane; select Apply (see Figure 5).

You can now customize your new toolbar using the Toolbar Preview pane. Begin by clicking the Manage tab of the ribbon, Customization panel, and then select User Interface. Now select the new toolbar. In the Command List pane, drag the command you want to add to the toolbar and drop it on the toolbar's preview in the Toolbar Preview pane. You can control where the command is placed by releasing the mouse button when the black vertical splitter bar is displayed. Continue to do this until all commands you wish to add are on the toolbar and then select Apply.

AutoCAD Architecture allows you to customize toolbars that are displayed in the application when the CUI Editor is open. You can simply drag commands from the Command List pane and drop then directly onto a visible toolbar that is docked or floating in the application window. You can also reposition, remove, or copy commands on a visible toolbar while the CUI Editor is open.

You can create new ribbon panels from a toolbar by dragging existing toolbars from the Toolbars node under the Customizations In <file name> pane to the Panels node under ribbon in the Customizations In <file name> pane. You will be prompted to convert a copy of the toolbar to a ribbon panel when the toolbar is dropped.

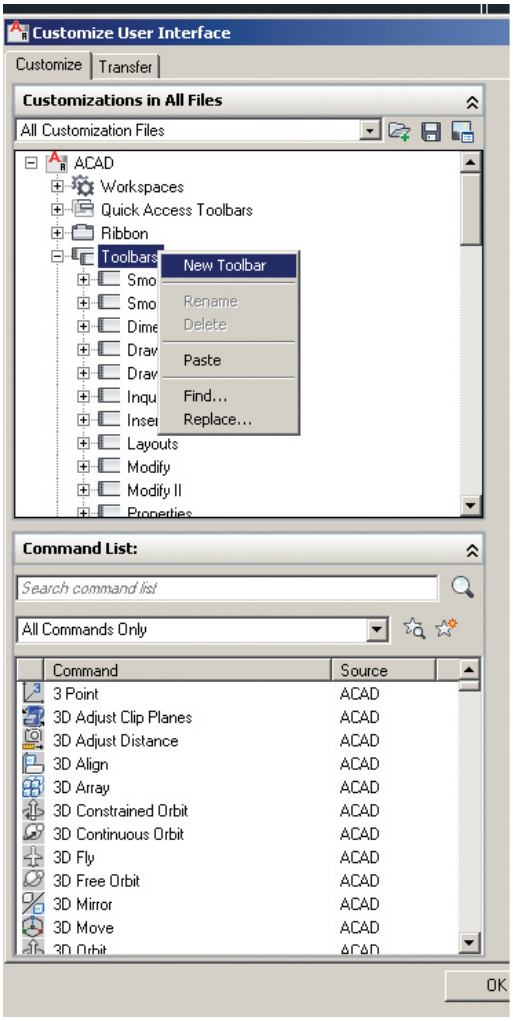


Figure 4: New Toolbar

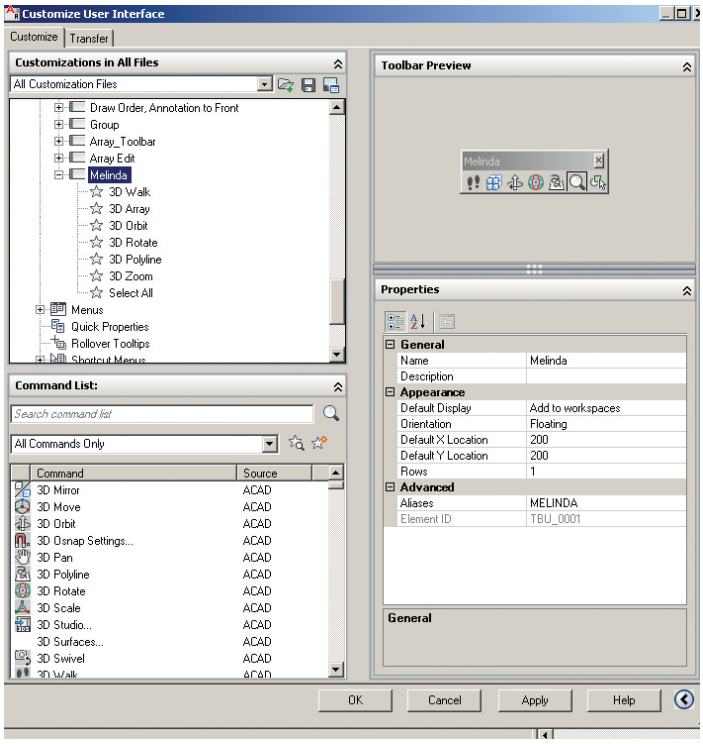


Figure 5: Customize Toolbar

CUSTOMIZING COMMANDS

You can easily create, edit, and reuse commands. The Customize tab of the CUI Editor allows you to add any command listed in the Command List pane to a toolbar or menu. You can create a new command from scratch, copy an existing command to create a new command, or edit the properties of an existing command within the CUI. When the properties of a command in the Command List pane are changed, the command is updated for all user interface elements that reference the command.

To create a new command in the CUI, begin by clicking the Manage tab of the ribbon, Customization panel, then User Interface. In the CUI Editor, Customize tab, Command List pane, select Create a New Command (see Figure 6). This will display a new command (named Command1) in both the Command List pane and the Properties pane. In the Properties pane, enter a name for the command in the Name box. It is important to note that the name is displayed as a tooltip or menu name when the command is added to a user interface element. In the Description box, enter a description for the command. The description will be displayed in a tooltip or on the status bar. In the Extended Help File box, enter the name of the file and ID to use for the extended help for the command. In the Command Display Name box, enter the name of the command that you want to display for the command. In the Macro box, enter a macro for the command. In the Tags box, enter the tags you want to use when searching for commands in the Search field of the application menu. In the Element ID box, enter an element ID for the command.

To edit a command, begin by clicking the Manage tab of the ribbon, Customization panel, and then select User Interface. In the Customize User Interface Editor, Customize tab, Command List pane, select the command you wish to edit. You can also select the command you wish to edit in the Customizations In <file name> pane tree view. In the Properties Pane, enter a name for the command in the Name box. In the Description box, enter a description for the command. In the Extended Help File box, enter the name of the file and ID to use for the extended help for the command. In the Command Display Name box, enter the name of the command that you want to display for the command. In the Macro box, enter a macro for the command. In the Tags box, enter the tags you want to use when search for commands with the Search field of the application menu. In the Element ID box, enter an element ID for the command. It is important to note that the element ID is for new commands only—you cannot modify the element ID of an existing command.

You can remove a command if you wish by right-clicking over the command and selecting remove; however, a command can only be removed when it is not being referenced by a user interface element such as a toolbar or menu. It is extremely important to note that there is no way to undo the removal of a command from inside the Customize User Interface (CUI) Editor. If you accidentally remove the wrong command the best thing to do is click Cancel, but this will also undo any other changes that you might have made. If you already made several changes to the CUIx file and do not want to lose the changes that you already made, you can open the backup CUIx file that is automatically created after a change is made to a CUIx file from the Transfer tab (see Figure 7) and then proceed to recover the command that was accidentally removed. This applies to other user interface elements as well.

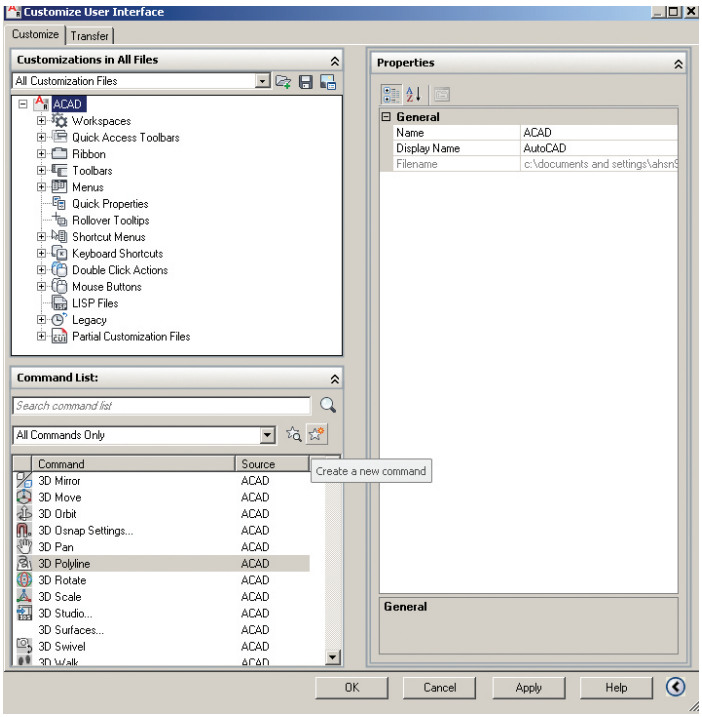


Figure 6: New command

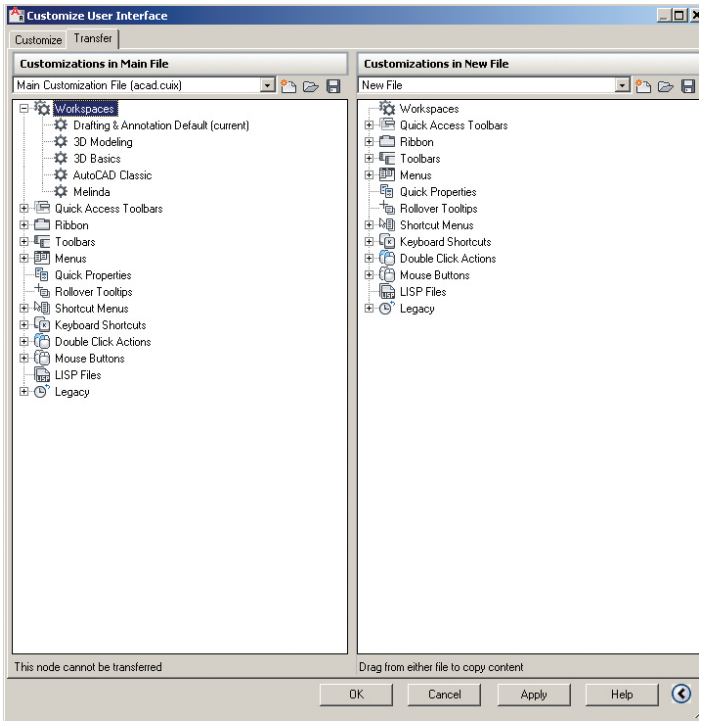


Figure 7: Transfer tab

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by Robert Green

HP ZBook Studio G3 – Big Bang in an Ultrabook

Thin, light and easy to carry Ultrabook™ devices – it's what everybody who travels with a computer wants to carry, right? Powerful quad-core processors, loaded with RAM, SSD's and powerful graphics GPU's – it's the level of performance every Autodesk user wants at their disposal when on the move. But there's no way to have both at the same time, is there? You can with the new HP ZBook Studio mobile workstation which HP describes as the world's first quad core workstation Ultrabook.[1]

THE SPECS

When you first pick up the HP ZBook Studio you can't help but focus on how thin (18mm/0.72") and light (4.4lbs[2] in base configuration) yet sturdy the 15.6" display size machine feels. Given the size you'd expect more basic internals and lower power like other Ultrabook class machines but a quick glance at the spec sheet reveals that a certified Autodesk-class workstation lurks inside.

Here are a few of the performance highlights:

- High clock rate Intel® Core™ or Xeon® quad core processors[3]
- Up to dual HP Z Turbo Drive G2 (NVMe PCIe SSD) for a total of 2 TB of total storage[4]
- Up to 32 GB ECC memory[5]
- NVIDIA® Quadro® M1000M 2 GB GDDR5 GPU[6]

For most Autodesk applications these specifications can provide a very fast user experience – particularly with support for the high performance Z Turbo Drive SSD's. Most Autodesk users would be happy to have a desktop machine with these specs let alone something that carries easily on business trips.

OTHER USEFUL OPTIONS

Beyond the basic functional specs the HP ZBook Studio has some other available options that allow you to customize it to the workloads your user's experience. A few of these features to note:

Windows 7 or 10 support from factory. Allowing you to provide the operating system that makes the most sense for your user base and software needs.

Available FHD touch screen. For Windows 10 users who prefer a non-mouse based interface.[7]

HP DreamColor UHD (4K) screen. For color sensitive applications and tasks like video processing, animation or rendering.[7,8]

EXPANDABILITY

To connect to all manner of external devices – including high bandwidth Thunderbolt hard drives, scanners and video cameras - there are a variety of connectors to facilitate most anything you'd like to plug into the HP ZBook Studio as listed here:

- Wired and wireless LAN and Bluetooth®
- 3 USB 3.0 ports (1 charging)
- Dual Thunderbolt™ 3 ports

- HDMI port
- SD UHS-II flash media reader (SDHC, SCXC compliant)
- RJ-45/Ethernet

If other connectors are desired the new Thunderbolt based HP ZBook Dock ($229) can be plugged into the on board Thunderbolt port to add a wide variety of capabilities including a locking security port, dual Thunderbolt extension ports, dual 4K DisplayPorts, VGA legacy port, 4 USB 3.0 (one charging) ports, wired Ethernet port, and an intelligent charging capability that allows the HP ZBook Studio to charge via the HP ZBook Dock's Thunderbolt cable.

RELIABILITY

At the end of the day the HP ZBook Studio is still an HP Workstation and as such it offers reliability and quality not found in typical consumer machines, including:

Cooling. Dual fans with airflow management results in lower operating temperatures and whisper quiet operation.

MIL STD testing[9]. Designed to pass punishing MIL STD 810-G specifications.

Warranty. Parts, labor and on site coverage for a full three (3) years.

HP Performance Advisor. A preloaded software tool that keeps the workstation's certified drivers for installed software applications up to date.

Security. HP Sure Start restores productivity and reduces IT help desk calls in the event of a BIOS attack or corruption.

WRAPPING UP

As more Autodesk users travel the more they need a workstation class machine that can power through large data sets, is easy to carry, and can interface with high bandwidth peripherals increasingly required when operating in the field. The HP ZBook Studio fulfills all these requirements in an easy to use mobile workstation that'll work equally at home on your desktop cranking through Autodesk workloads or in the boardroom for a presentation.

ABOUT HP

HP helps you stay ahead of the curve with professional desktop and mobile workstations designed for large and complex datasets, dispersed teams, and tight deadlines. HP Z Workstations, built for Pros with Intel® Inside®, deliver the innovation, high performance, expandability, and extreme reliability you need to deliver your 3D CAD projects in less time. To learn how to configure a HP Z Workstation, visit the HP and Autodesk page at www.hp.com/go/autodesk. Start saving now!

ABOUT ROBERT GREEN

Robert Green provides CAD management consulting, programming, speaking, and training services for clients throughout the United States, Canada, and Europe. A mechanical engineer by training and alpha CAD user by choice, Robert is also well known for his insightful articles and book, Expert CAD Management: The Complete Guide. Reach Robert at rgreen@greenconsulting.com

1. Based on HP's internal analysis of all mobile workstation models from any vendors with >200 thousand unit annual sales as of October 29, 2015, having Quad-core CPU's, with Intel's Ultrabook Certification.
2. Weight will vary by configuration.
3. Multi-Core is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. Intel's numbering is not a measurement of higher performance.
4. For hard drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 16GB (for Windows 7) and up to 30GB (for Windows 8.1) of system disk is reserved for system recovery software.
5. ECC Memory is an optional feature available with Intel® Xeon™ configurations.
6. Sold separately or as an optional feature.
7. Not all models will qualify as an Ultrabook.
8. DreamColor and Touch options are expected to be available mid-2016. All specifications represent the typical specifications provided by HP's component manufacturers; actual performance may vary either higher or lower.
9. MIL STD 810-G testing is pending and is not intended to demonstrate fitness for U.S. Department of Defense contract requirements or for military use. Test results are not a guarantee of future performance under these test conditions. Damage under the MIL STD test conditions or any accidental damage requires an optional HP Accidental Damage Protection Care Pack.

by: Brian Chapman

Constructing an Interior Scene

This tutorial is designed to show the techniques used to construct an interior scene using 3ds Max®, VRay, and the raster-based image editing software Adobe Photoshop as well as show how to construct the various elements identified and shown in Figure 1. The objects identified are listed below.

1. The canvas art
2. The shelf
3. The lamps
4. The doors
5. The candles
6. The tea tray
7. The pillows

Figure 1: Scene objects

ROOM CONSTRUCTION

Items not identified in Figure 1 consist of the floor, walls, and ceiling. The floor, walls, and ceiling are constructed with 2"x8"x12' boxes and textured with wood shown in Figure 2. The boxes were placed with gaps to provide additional detail when rendered. The beams in the ceiling were constructed with 4"x12"x20' boxes.

Figure 3: Photoshop alterations

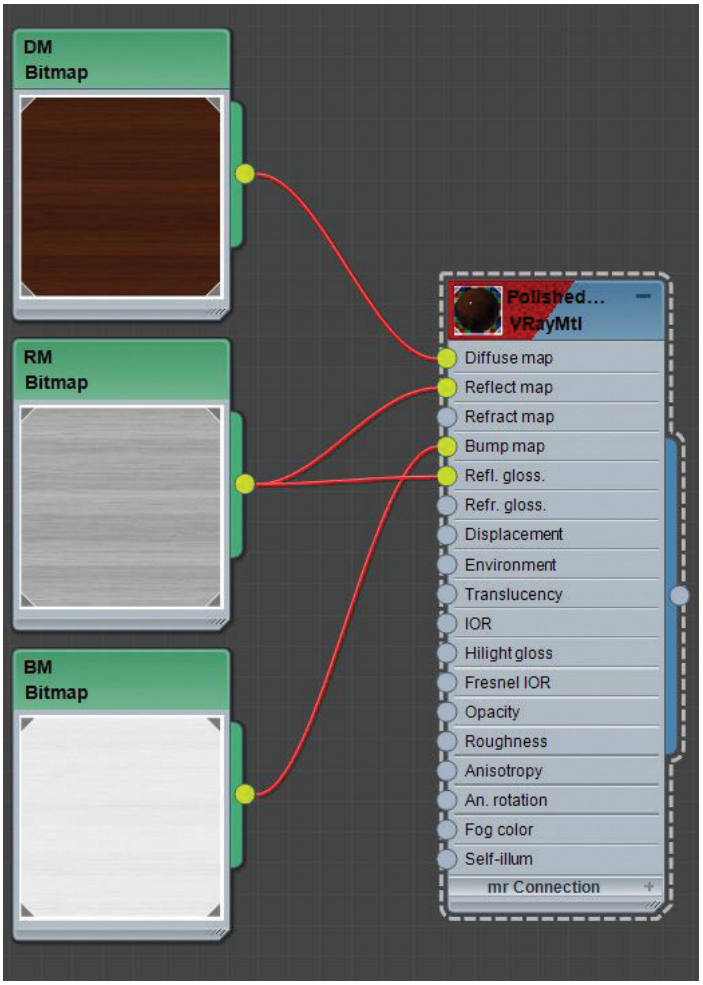


Figure 2: Wood material

Object One – The Canvas Paintings

The canvas paintings were constructed using a box with autogrid and extruded from the wall. The box was copied to its side then the symmetry modifier was used to duplicate them to the opposite side of the room. Each box was finally assigned a material with an image in the diffuse slot. The image consisted of various artwork and photos blended together using Adobe Photoshop (software difficult to not mention when talking about post production or texture work). The steps to modify the art in Photoshop are shown in Figure 3.

To offset the red and yellow colors in the room and generate a somewhat chromatic effect I wanted colors like blue and white. In Photoshop I started with a blue background then overlaid various images and artwork in layers above it. The first step was to convert those images to black and white. Then I set the black and white overlay to the Hard Light blending option. After that I brushed in some blues and whites and tweaked the color correction as I desired. Finally, I used the clone stamp tool to modify the images and make them unique.

Object Two – The Shelf

The shelf and plants were simply my attempt to pull the viewer's eye through the entire scene and create interest in an otherwise empty area. The wooden objects on the top shelf, the bowl, and the vase were all constructed using a line with the lathe modifier. The materials created for the paintings were also used for the bowl and vase. The plate was constructed with cylinder with insets and the turbosmooth modifier. The shell modifier was added to give the plate thickness. The general steps for the construction of the items are shown in Figure 4.

Figure 4: Shelf objects

Object Three – The Lamps

The lamps were constructed primarily with cylinders. The only exceptions were the lines that were arrayed by moving the pivot point to the center of the cylinder and entering the number of items I wanted to create as shown in Figure 5. Finally a VRay 2-sided material was used with Vray sphere lights so the lights shined through the lamp material.

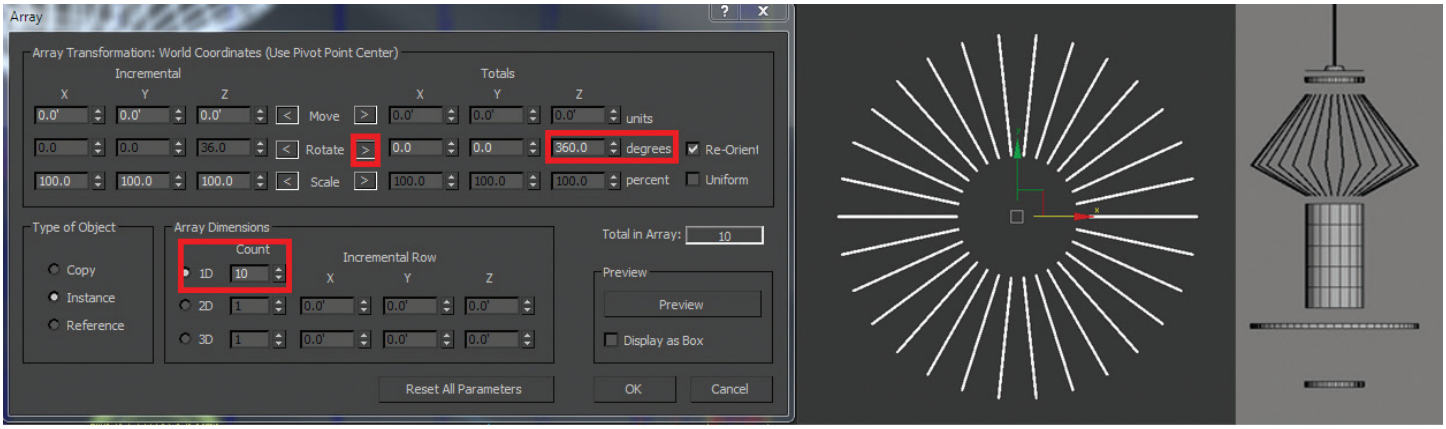


Figure 5: Lamps

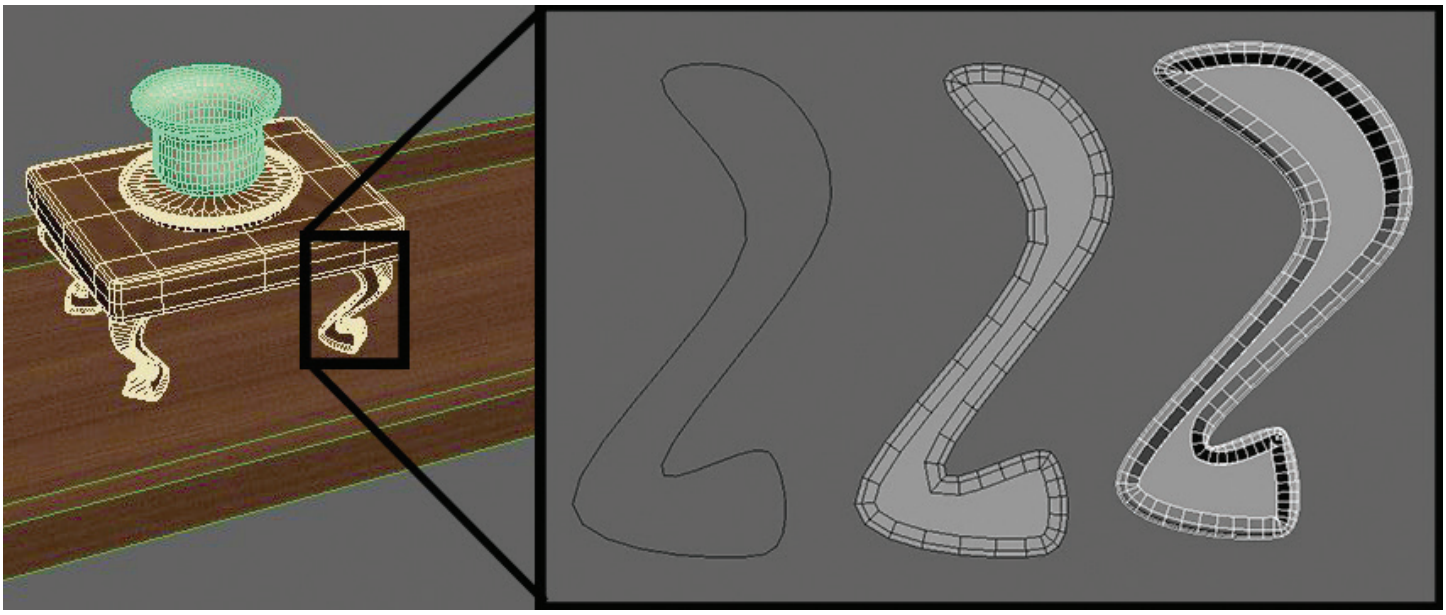


Figure 6: Tea Tray Leg

Object Four – The Door

The door was constructed using a simple plane then converted to an editable poly. After conversion I selected all the edges and chose the chamfer option, which created offsets for each line. I could then extract the faces and assign the wood and shade material I wanted.

Object Five – The Candles

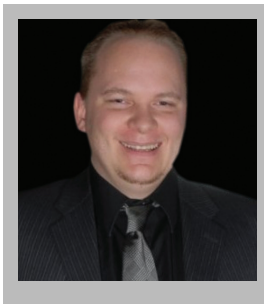
The candles were constructed with a line segment and then converted to an editable poly. On top of each candle I placed a VRay sphere light. Ultimately I used Photoshop to add the candle flames and enhance the reflection on the floor.

Object Six – The Tea Tray

The tea pot, though difficult to see, was constructed with a modified version of the default tea pot provided with 3ds Max (perhaps the first time I've found use for it) and basic polygons. The only exception was the leg for the cup stand, which was constructed with a spline shape and series of insets shown in Figure 6.

Object Seven – The Pillows

Finally, the pillows were constructed with boxes with a large number of segments and shaped using the free-form tools in the Graphite Modeling ribbon.



Brian Chapman is creator of Pro-Cad.Net and Senior Designer for Slater Hanifan Group, a civil engineering and planning firm dedicated to superior client service. Brian can be reached at procadman@pro-cad.net.

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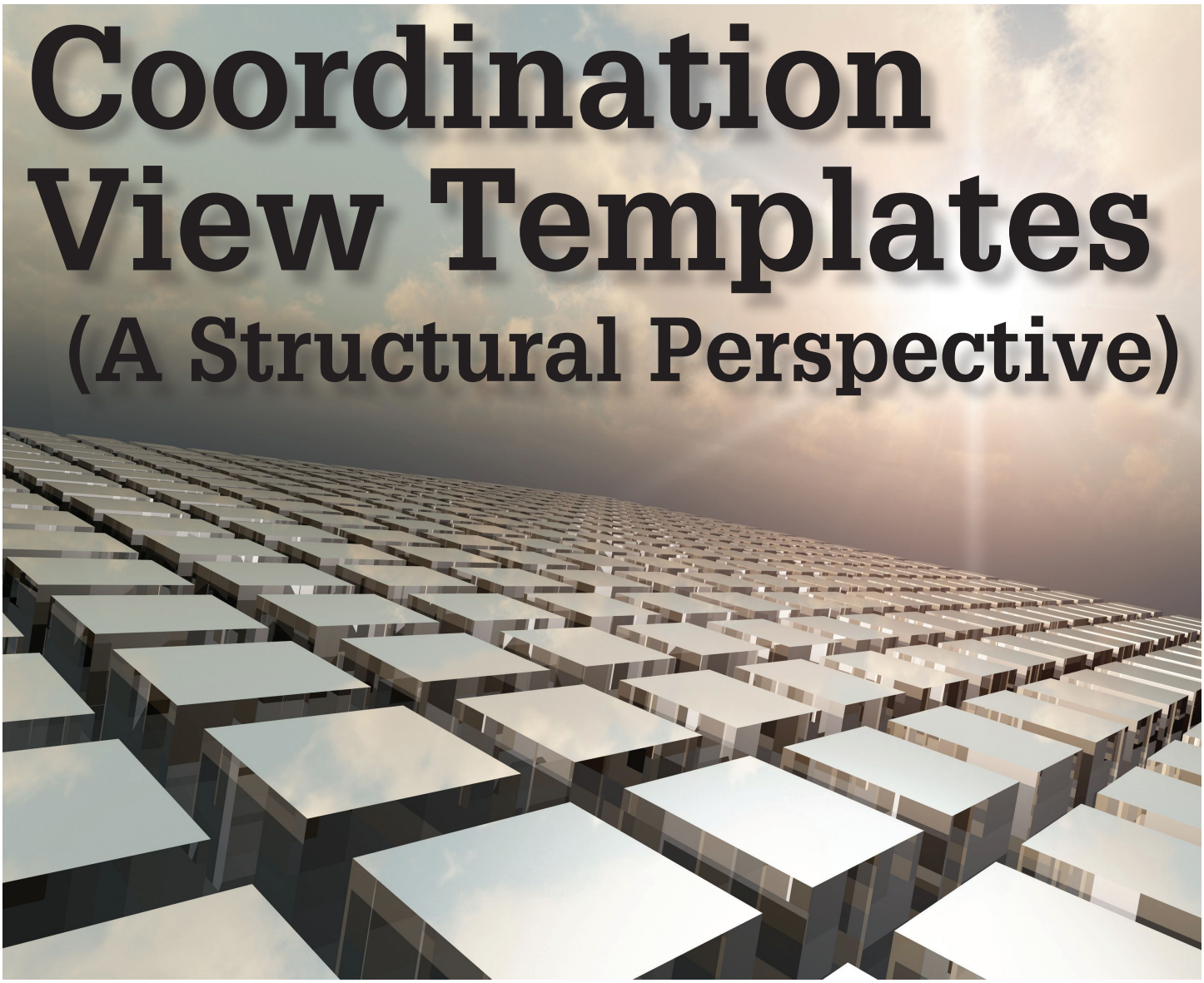
by: Raul Pacheco

Coordination View Templates (A Structural Perspective)



Coordination among discipline models is a key component in a building information model (BIM) workflow. Coordination view templates are an integral part in a structural workflow environment. We tend to focus more on view templates for production purposes and to be included in document sheet sets. In this article, I will delve into an advanced procedure for developing coordination view templates for plans, floor slabs, and 3D views.

VIEW TEMPLATES

A brief overview on view templates: A view template is a collection of view properties such as view scale, discipline, detail level, and visibility settings. The use of view templates in Autodesk® Revit® workflow has its advantages. A number of view templates can be predefined with specific properties and visibility settings in order to maintain consistent standards and to streamline project coordination and drawing document sheet sets.

In the examples below, I will outline the process for creating different coordination view templates—each containing predefined visibility and graphic display settings.

THE PLAN COORDINATION VIEW TEMPLATE

When creating a plan coordination view template, the first thing to do is to create a plan view. This can be done by duplicating a structural plan view. There are three options for duplicating a view: 1) Duplicate View creates a copy of the plan view with model geometry only; 2) Duplicate view with Detailing creates a copy of the view with both the model geometry and the detail geometry; 3) Duplicate as Dependent creates a copy of the view and remains synchronous with the primary view and all other dependent views (if more than one dependent view is created from the same view). Dependent views are usually created for projects with large footprints that are split into segments as partial plans. The partial plan segments can be placed on multiple sheets. When you make

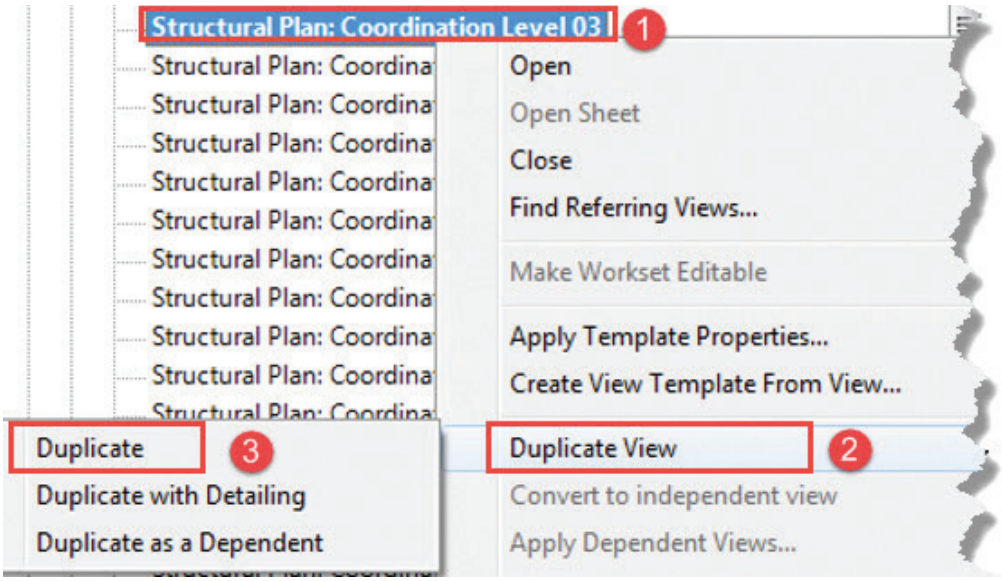


Figure 1: Duplicate view

changes to dependent segments of a view, the changes affect the parent view as a whole. For the purpose of simplicity in this article, option 1 will be used.

Let's create a plan view for our coordination view template. From the project browser select an already defined structural plan view.

1. Right click on the view
2. Select Duplicate View
3. Select Duplicate
4. Rename it to Coordination Level 03 (or its corresponding level)
5. Repeat the process to duplicate all the view levels needed in the project

CONFIGURING VISIBILITY GRAPHICS

From the View tab under the Graphics tab, click Visibility Graphics (Shortcut VV, VG) under Visibility Graphics Overrides.

1. Click Revit Links tab
2. Select the Arch.rvt link; under Display Settings select By Host View
3. From the RVT Link Display Setting Basic tab
4. Click the Custom Radial button
5. From the Discipline drop-down list, select Coordination and Click OK
6. Click the Model Categories
7. From The Model Categories tab drop-down list, select Custom
8. From the Show Model Categories in view from the Filter drop-down list, check Architectural discipline and uncheck all others
9. From the Visibility column, select all model categories
10. From the Projection/Surface, select the lines column
11. Under Line Graphics select a color of your choice. From the color palette select Red or another color of your choice to represent architectural discipline. I like to use reds because it stands out the most and is our standard for coordination
12. Click Apply and OK to close

Repeat steps 9 through 12 for the Cut option.

Repeat the steps above to change graphic overrides for the pattern projection/Surface and cut. There is an additional step to add an override pattern of choice. Solid fill works nicely for walls and columns.

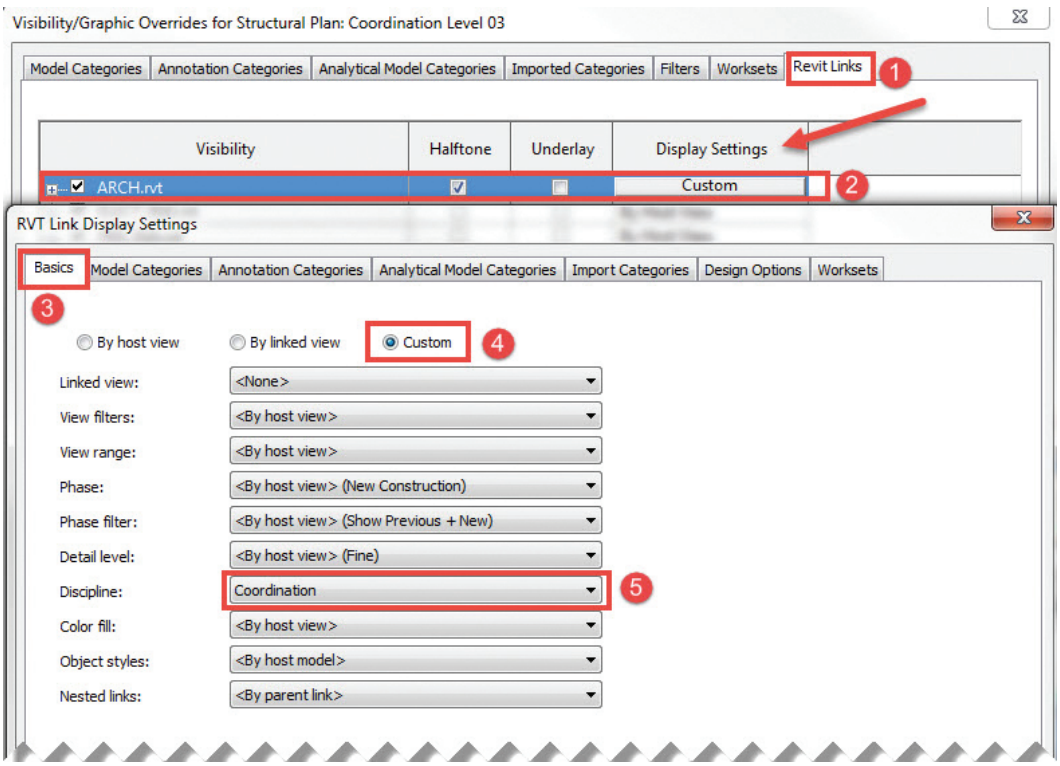


Figure 2: Visibility Graphic Overrides plan coordination linked model

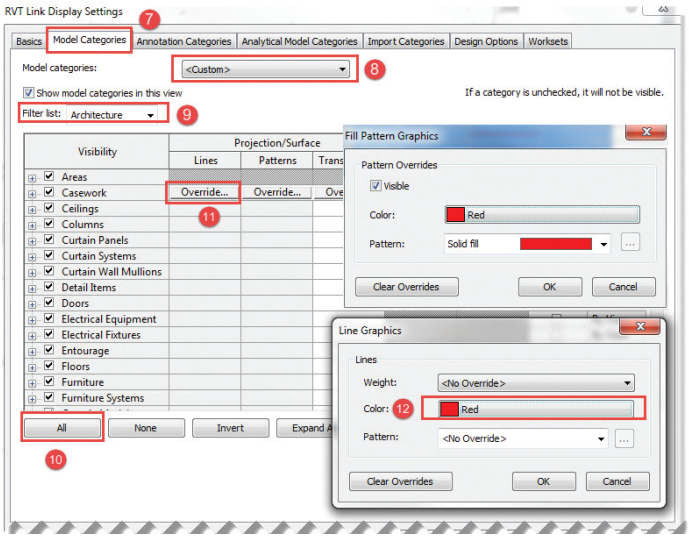


Figure 2a: Visibility Graphic Overrides plan coordination linked model

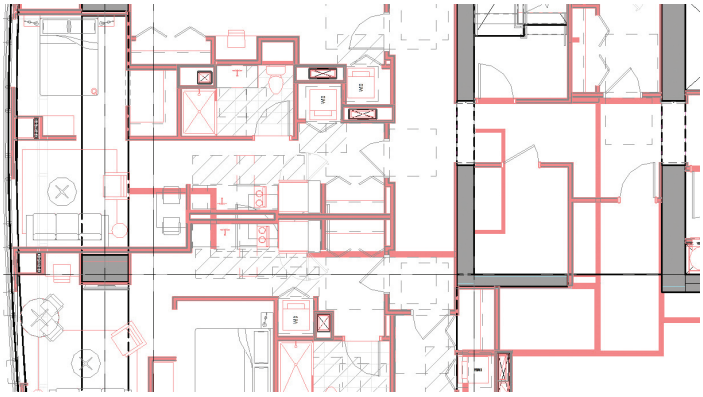


Figure 3: Plan View template arch background in red

CREATING THE FLOOR PLAN VIEW TEMPLATE

Once Visibility Graphic Settings are predefined you are ready to create the view template. From the View tab under the Graphics tab:

1. Click the View Templates drop-down list
2. Select Create Template from Current View
3. Enter a name for the view template

I often use the name _Coordination Plan Level ##. Notice that an underscore is placed as the prefix to the name for the purpose of sorting and organization in the Project Browser. You can use numbers or other alphanumeric characters. Tip: you can filter views by discipline filter and view type filter. I use filter by discipline Structural and leave the View type filter as the default <Plans, Structural, Area Plans> because this is a structural Coordination View Template.

Additional settings can be applied in the View Templates (i.e., View Scale, Display Model, Detail Level, Filters, Links, View Range, etc.) You can get as granular as required for your project-specific needs in order to streamline repetitive graphic settings and be more efficient. Be brave and play around with different settings. The possibilities are endless.

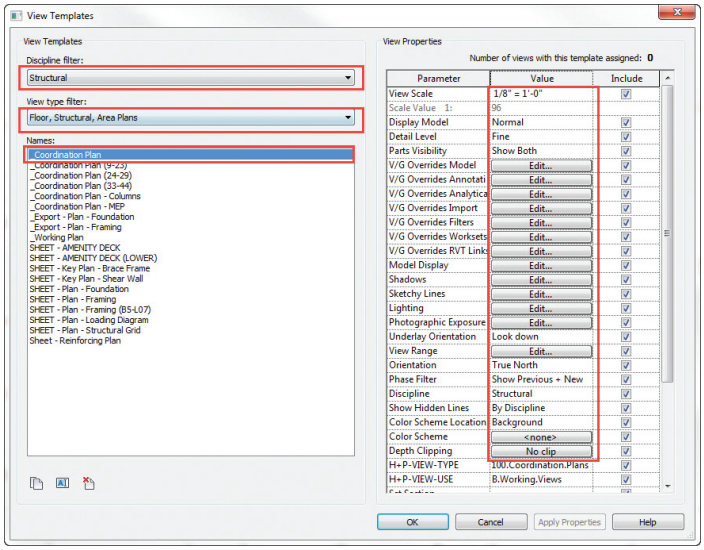


Figure 4: Creating the view template

THE SLAB EDGE COMPARISON VIEW TEMPLATE

To create a Slab Edge Comparison view template to compare and coordinate the Architectural Floor Slab with the Structural Slab Edge: 1) Duplicate a plan view; 2) Rename it to Coordination Slab Edge Level 03.

From the View tab under the Graphics tab:

1. Click Visibility Graphics (Shortcut VV, VG) under Visibility Graphic Overrides.
2. Click the Model Categories tab
3. From the Show Model Categories in view from the Filter drop-down list, check Structural discipline and uncheck all others
4. From the Visibility column, select all model categories
5. Clear the checkbox under Visibility
6. Select None to clear the selection
7. Select the floor and hit the checkbox
8. From the Projection/Surface, select Line
9. Under Line Graphics choose the color green from the color palette or another color of your choice to represent the Structural discipline
10. Click Apply and OK to close

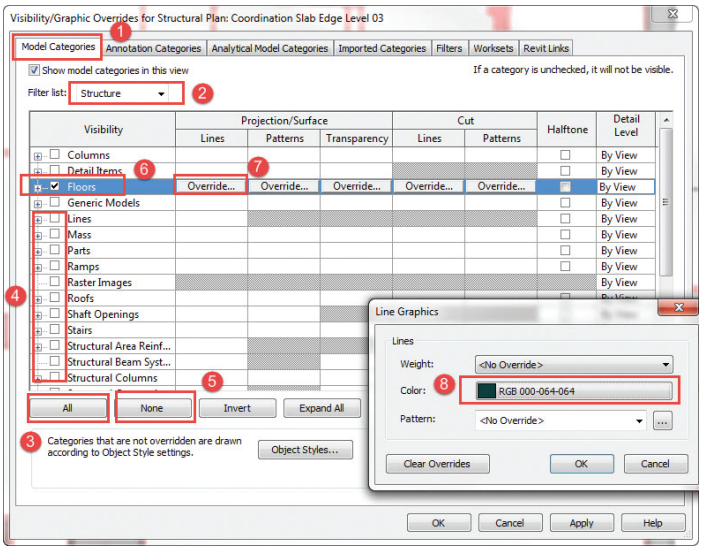


Figure 5: Slab Edge Comparison view template

1. Click Revit Links tab
2. Select the Arch.rvt link; under Display Settings select By Host View
3. From the RVT Link Display Setting Basic Tab
4. Click the Custom Radial button
5. From the Discipline drop-down list, select Coordination and Click OK

Note: Steps 1 through 5 are the same as the steps in the Coordination view template.

6. Click the Model Categories
7. From The Model Categories tab drop-down list, select Custom
8. From the Show Model Categories in View from the Filter drop-down list, check Architectural discipline and uncheck all others
9. From the Visibility column, select all model categories
10. Uncheck Visibility for all categories
11. Select None to unselect categories
12. Select the Floor category
13. From the Projection/Surface, select the Lines column
14. Under Lines Graphics select a color of your choice. From the color palette select Red or another color of your choice to represent architectural discipline.
15. Click Apply and OK to close

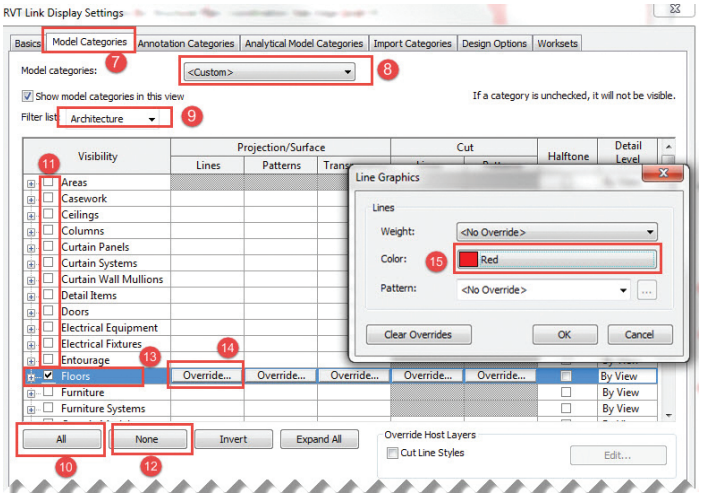


Figure 6: Slab Edge Comparison view template linked model

CREATING THE SLAB EDGE COMPARISON VIEW TEMPLATE

Once Visibility graphic settings are predefined you are ready to create the view template. From the View tab under the Graphics tab:

1. Click the View Templates drop-down list
2. Select Create Template from Current View
3. Enter a name for the view template

I use _Coordination Slab Edge Comparison. Make additional changes to the view template per project requirements.

APPLY THE VIEW TEMPLATE TO VIEWS

From the Project Browser select the views to which you will apply the view template.

1. Right-click and choose Apply View Template; the Apply View Template dialog box opens
2. Select the _Coordination Plan View Template
3. Click Apply Properties
4. Click OK

Repeat the same process to apply the _Coordination Slab Edge Comparison View Template to Slab Edge Comparison Plans

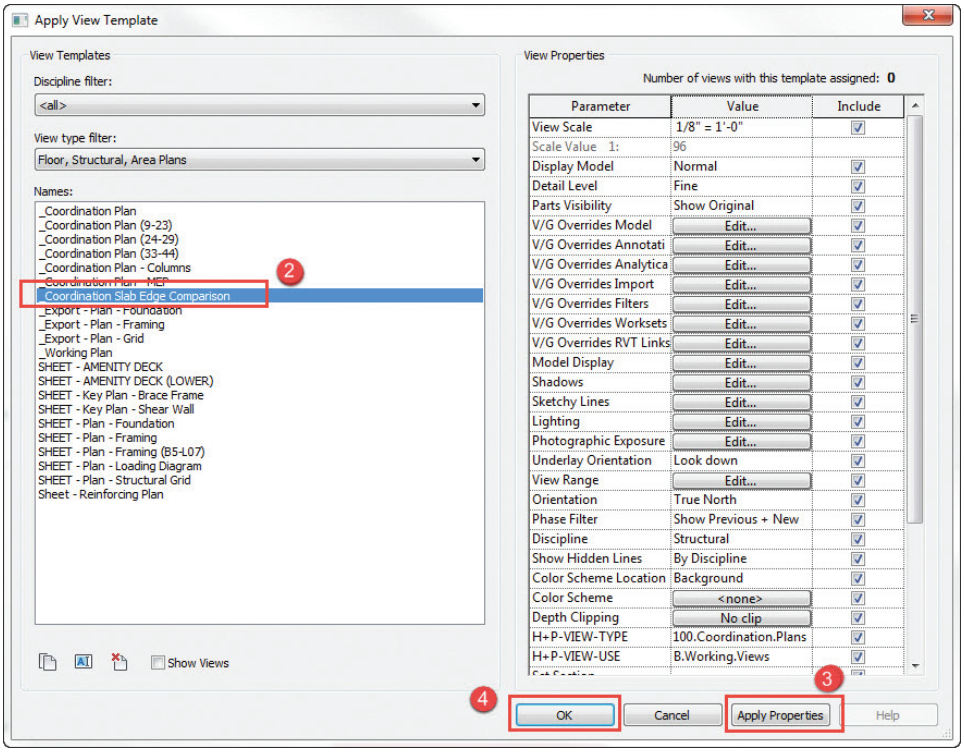


Figure 7: Apply the view template

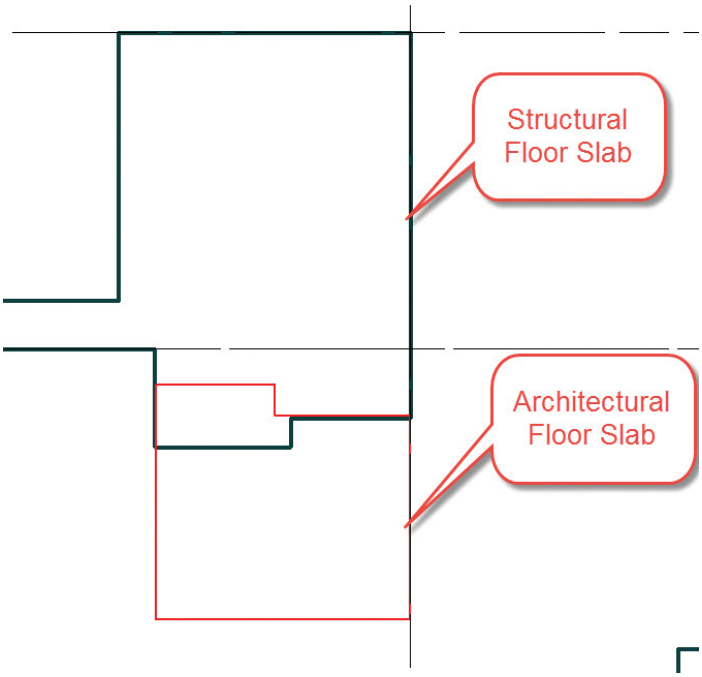


Figure 8: Slab Edge Comparison view template graphic

CREATING A 3D VIEW TEMPLATE

You can follow the steps outlined above to modify the Visibility Graphic Settings for 3D views and to create a 3D View Template.

CREATE CATEGORY-BASED DISCIPLINE FILTERS

To create category-based discipline filters:

1. From the Manage Tab under the selection tab, click Edit
2. From the Edit Filters dialog box, click New
3. Provide a name for the filter in the dialog window
4. From the Categories Filter list, select a discipline
5. Place a checkbox for each of the categories to be included in the filter
6. You can also apply Filter Rules if you want to be more specific on what to include/exclude from a filter
7. Click OK

Repeat the steps above to create category-based filters for other disciplines.

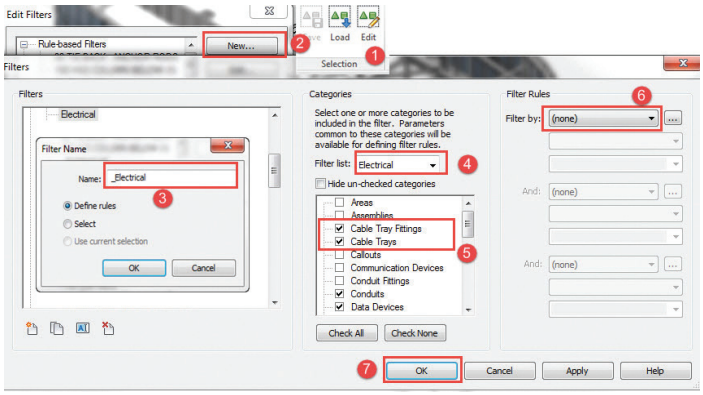


Figure 9: Create category-based discipline filters

APPLY CATEGORY-BASED FILTERS

The next step is to apply the Category-Based Discipline Filters to a view. Add category-based discipline specific filters to a plan or 3D coordination view. The cool thing about filters is that they can be applied to any view.

1. Open the Visibility/Graphics dialog. Click View tab graphics panel (Visibility/Graphics) or VV or VG
2. From the Visibility/Graphics dialog, select the Filters tab
3. Click the Add button
4. Select as many filters as needed. Use the Shift or Control keys to select multiple filters
5. Click OK

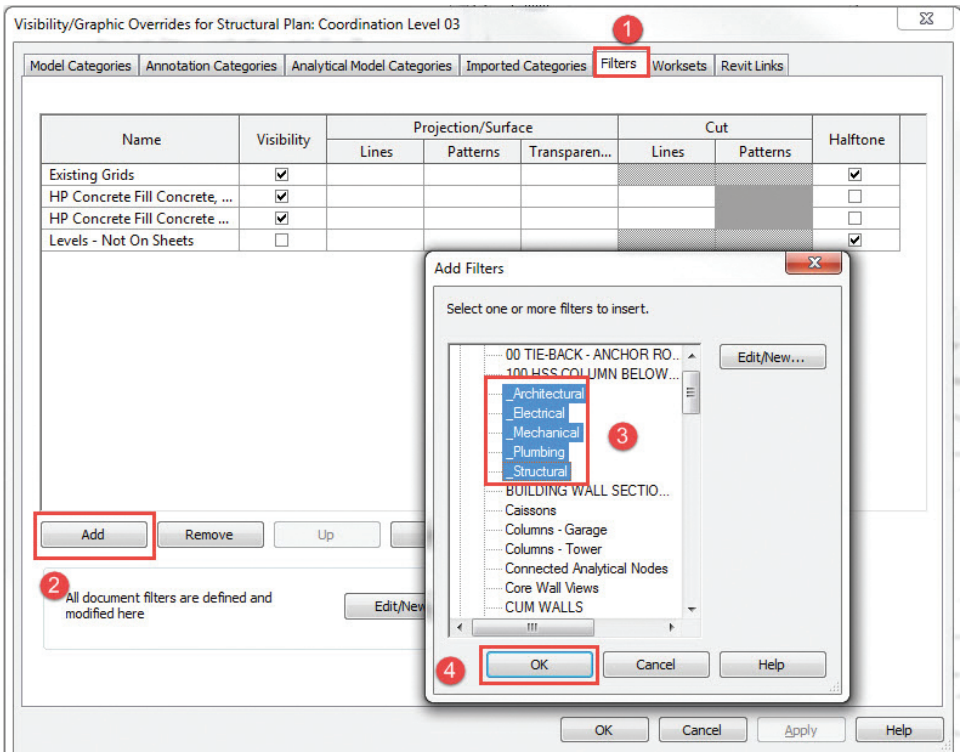


Figure 10: Apply discipline-specific filters

In the Visibility Graphics dialog window:

6. Under Projection/Surface, change the override color for each of the filters
7. Change the Fill Pattern Graphics Pattern Overrides color
8. Change the color for patterns and cut
9. If needed, change the transparency

Filters can also be used to exclude elements from a view.

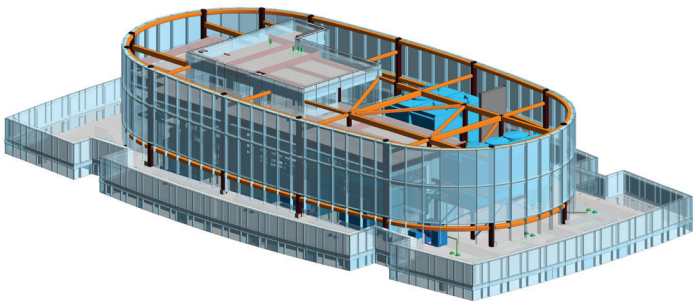


Figure 11: 3D Coordination View

SAVE THE VIEW TEMPLATES TO THE REVIT TEMPLATE

You can save the view templates to your corporate Revit template or container file to use on other projects.

CONCLUSION

By implementing the process outlined here you can quickly determine where coordination is needed. This can also be accomplished with coordination review if copy/monitor was used early on in the design phase. Coordination views can be used, especially if Structural has already taken floor slab ownership and copy/monitor is no longer an option and the Architect continues to make design changes well into construction document phase. Coordination view templates in conjunction with filters can also be used for model quality control review. Use coordination view templates to streamline your workflows and save time.

Raul Pacheco is currently the Building Information Modeling (BIM) manager at Halvorson and Partners, a structural engineering firm in Chicago that offers comprehensive structural engineering services on a wide range of projects to both public and private clients worldwide. H+P offers special expertise in the design of structures that require a unique vision, such as high-rise buildings, long-span structures, and projects with challenging existing conditions. Raul provides training and support and is involved in projects using Revit Structure software. Raul's experience expands more than 25 years in the use of CAD and BIM applications. In his previous role as the digital design manager in the Chicago office of Skidmore, Owings, & Merrill LLP (SOM), Raul was responsible for BIM implementation, oversaw the implementation of digital design technology, visualization, sustainable, and building performance analysis applications. Raul has worked on various high-rise super-tall and high-profile projects around the world. You can reach out to him at rpacheco@hpse.com

by: Andrew Walther

British Columbia MMCD Infrastructure Data Initiatives – A Standardized Approach

INTRODUCTION

AutoCAD® Civil 3D is an extremely versatile civil design tool used in the transportation, municipal infrastructure, land development, energy, mining, and other engineering design sectors. Each of these sectors has its own nuances that drive data flow requirements and consequently how and where AutoCAD Civil 3D functionality is plugged into the respective processes.

A few years ago I wrote an article for *AUGI World* entitled "BIM – Fact or Fiction," which was an attempt to bring some clarity to whether or not AutoCAD Civil 3D could be categorized as BIM software. Unfortunately, this type of categorization is not that cut and dried as industry needs with regards to data usage, movement, and storage are so variable. While many BIM concepts and principles initially founded in the architecture and building industries are applicable to civil engineering, as the saying goes, you simply cannot compare apples and oranges. Generally speaking, and to summarize the past article, BIM concepts applicable to civil engineering manifest themselves in the following areas.

- Moving data through process adjacent project phases (data repository to planning to design to construction to data repository);
- Data sharing between design team members on a single project; and
- Lifecycle management incorporating both asset and financial management needs.

AutoCAD Civil 3D works within the realm of BIM concepts with the first two bullet points. Lifecycle management for civil infrastructure is facilitated by incorporating GIS, asset, maintenance, and financial management systems and standards into municipal and other civil engineering processes.

This article addresses the requirements for consistent standards applicable to the BIM concepts of data movement and data sharing, two key components for process optimization. Standards are now necessary beyond the confines of a single drawing and must accommodate the movement of data between process adjacent phases. Continue reading to learn how organizational support for standards applicable to local governments, surveyors, consulting firms, and construction contractors can have huge impacts on process optimization and overall product usage efficiency.

MMCD – MASTER MUNICIPAL CONSTRUCTION DOCUMENTS ASSOCIATION

MMCD (www.mmcd.net) is a British Columbia non-profit organization founded in the mid-1980s to develop infrastructure standards to help eliminate the duplicity of infrastructure management efforts by the 170 Local Governments and 200 First Nations Bands in the Province of British Columbia Canada. These standards manifested themselves in both infrastructure specifications

and contract documentation and to this day have been adopted by approximately 60 percent of BC Local Governments and First Nations Bands.

Fast forward to 2009 when AutoCAD Civil 3D was starting to take a formidable bite out of Land Desktop as the primary design software used by BC consultants for survey, roads, sanitary sewer, water main, storm drain, and site grading tasks.

Most local governments did not have the internal capabilities to develop standards-laden AutoCAD Civil 3D drawing templates for consultants to use for infrastructure design and land development projects. Compounding the problem was the fact that common base AutoCAD standards—layers, block definitions, text/dimension/multileader styles, page setup definitions, and plotting configuration files—were the exception rather than the norm.

Consequently, engineering consultants embarked on further duplicate efforts to develop their own templates to meet the variable standards requirements for BC local governments. The drawing templates and resulting engineering design and construction drawings were heavily guarded as they exposed internal processes and valuable techniques that perceivably resulted in better productivity and more efficient design processes. This protectionism of "intellectual property" is still a dominant issue facing BC engineering consultants to this day.

Shortly after AutoCAD Civil 3D began to take a strong foothold as the primary design tool in BC, MMCD realized the benefit of developing a common CAD standard, based on AutoCAD Civil 3D, that would be provided to BC local governments and consultants free of charge as part of their MMCD membership. The MMCD Municipal CAD Standard was born.

Since then this new CAD standard has evolved significantly and expanded to include other infrastructure management processes—drawing production, construction, record data collection (as-builts), and lifecycle management. After recommending the development and continued support for a common CAD standard based on AutoCAD, little did I know this was to become an asset management initiative that had far-reaching impacts on infrastructure procurement and lifecycle management practices in BC.

LOCAL GOVERNMENT FINANCIAL ACCOUNTABILITY FOR INFRASTRUCTURE ASSETS

In 2006 the Canadian Institute of Chartered Accountants introduced the PSAB 3150 (Public Sector Accounting Board) accounting standard, which provided guidelines and standards for local governments to report tangible capital assets (infrastructure) on annual financial statements. Incidentally a similar infrastructure accounting requirement in the United States is GASB 34 (Governmental Standards Accounting Board).

This new federal mandate not only prompted local governments to update existing infrastructure records, but also added emphasis to the collection of data on new infrastructure. The latter impact emphasized the need to optimize process for the submission of digital as-built data to local governments once completed. The MMCD Municipal CAD Standard was positioned as an asset management initiative due to the fact that once infrastructure construction is complete the digital design document is copied and updated to reflect as constructed conditions. This digital "as-built document," or record drawing, is inherently data rich by virtue of AutoCAD Civil 3D objects (pipe and pressure networks).

With the addition of other tools for infrastructure data attribution (Map 3D object data) it became reasonable for a local government to require post-construction submissions with all the necessary data that could be directly sourced to update databases shared by GIS, financial management, asset management, and maintenance management systems. This was the first step in the development of the suite of infrastructure data standards, largely based on AutoCAD Civil 3D, to meet the new lifecycle management requirements of local governments.

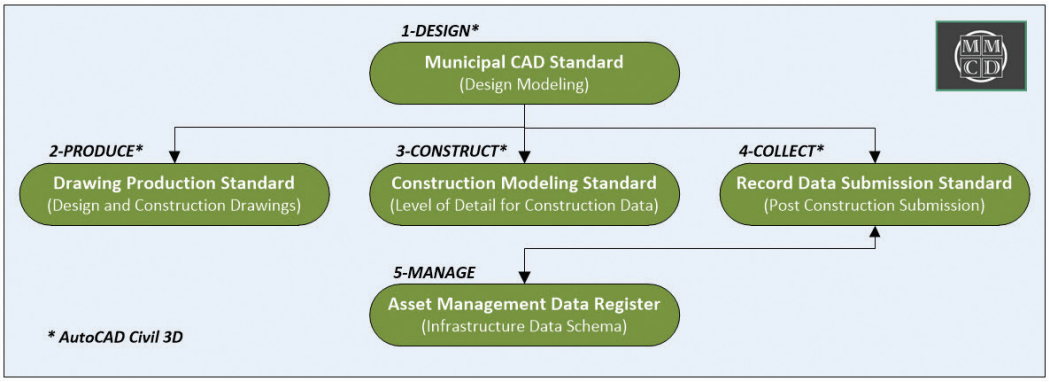
MMCD INFRASTRUCTURE DATA STANDARDS

As mentioned earlier in the article, the MMCD infrastructure data standards initiative started in 2009 with the introduction of the MMCD Municipal CAD Standard. The intent of this AutoCAD Civil 3D-based standard was to provide local governments and engineering consultants with an opportunity to get on the same page with design document content standardization and consistency with infrastructure and land development drawing production standards.

As a direct result of federal requirements for TCA (Tangible Capital Assets) accounting, local governments' emphasis also shifted to post-construction data submissions. AutoCAD Civil 3D presented an opportunity for data rich submissions because of the inherent attribution of physical properties in the object data model. The concept was to copy the design document, update it to reflect as constructed conditions, add additional attribution, and submit this "constructed recorded" document to the local government for consumption by their infrastructure databases.

An infrastructure data standards development strategy ensued that outlined development plans for design, drawing production, construction, record data collection, and lifecycle management standards. AutoCAD Civil 3D would play an integral role in all but the lifecycle management component, once the asset data has been received.

The five standardized components that are reflective of the process are shown in the following illustration.



A summary of the individual components is as follows.

- **Municipal CAD Standard** – AutoCAD and Civil 3D standardized components for infrastructure and land development design modeling
- **Drawing Production Standard** – standardized callouts, text heights/styles, pen weights, and engineering drawing appearance based on the Municipal CAD Standard
- **Construction Modeling Standard** – standard for level of detail for design model data (corridors, alignments, profiles, etc.) required for machine control layout and construction
- **Record Data Submission Standards – IFC** (Issued for Construction) and post-construction submission standards for containing both graphical and attribute data
- **Asset Management Data Register** – a standard infrastructure data schema for storage with asset classes, attribute names, values, and standardized naming conventions

At the time this article was written, the individual standardized components are at varying levels of completion. Of significant importance to this initiative is the collaborative nature under which the standards have been developed. Local government and engineering consultants have literally "bought in" to the overall concept and have contributed their own investments in collaborative standards development back to MMCD. MMCD will, in turn, take overall responsibility for continued updates and improvements. This teamwork approach has truly been the key to the standards initiative.

CITY OF BURNABY – ASSET DATA EXCHANGE STANDARD

The City of Burnaby (pop. 225,000) is in BC's lower mainland next to Vancouver and has realized the importance of timely and accurate infrastructure asset data submissions required to update spatial and tabular databases. While graphical data was readily accessible via DWG format, manually transposing data from hard copy drawings provide to be costly and error prone, and was no longer an option. And so began the development of the Asset Data Exchange Standard. Based entirely on AutoCAD objects and AutoCAD Civil 3D data, these attribute-rich submissions could be processed (using Safe FME software) and moved to City of Burnaby Databases.

The Asset Data Exchange Standard applies to the following IFC (Issued for Construction) and post construction deliverables.

1. **Existing Recorded Assets Drawing** – At the beginning of the project this MMCD standardized AutoCAD drawing is created by extracting data from Burnaby ESRI ArcSDE GIS and contains existing infrastructure data within the project limits. Existing tracked assets (manholes, pipe etc.) are attributed with AutoCAD Map 3D object data. Eighty percent of Burnaby's capital program is for replacing assets that are at the end of their useful life and consultants are therefore required to update lifecycle state attributes to indicate an asset has been either retired or removed. One result is that the finance department can now take an asset "off the books," so to speak.
2. **Existing Surveyed Assets Drawing** – At the beginning of the project this ACAD/C3D MMCD standardized drawing is created by the consultant from GPS or total station survey data and contains detailed information on existing assets (C3D points and figures). The submitted drawing is used to validate and update location and other data for existing assets.
3. **Constructed Recorded Drawing** – Upon construction completion, the design drawing is copied, renamed, and updated to reflect as constructed conditions. Civil 3D pipe networks updates could include, for example, moving a manhole, adjusting pipe invert elevations, or adding/removing pipes or structures from the network. Further attribution of tracked assets is completed using AutoCAD® Map 3D object data tables—the same ones that are used in the Existing Recorded Assets Drawing.

These DWG-based submissions are then processed through Safe FME software to update City of Burnaby databases. As with all data that is moved through process adjacent roles, standards for data assembly must be developed and implemented. AutoCAD external references along with AutoCAD Civil 3D data shortcuts and reference objects play a key role in ensuring consultants can meet the required deliverables for the City of Burnaby.

ASSET DATA EXCHANGE STANDARD AND DRAWING ASSEMBLY

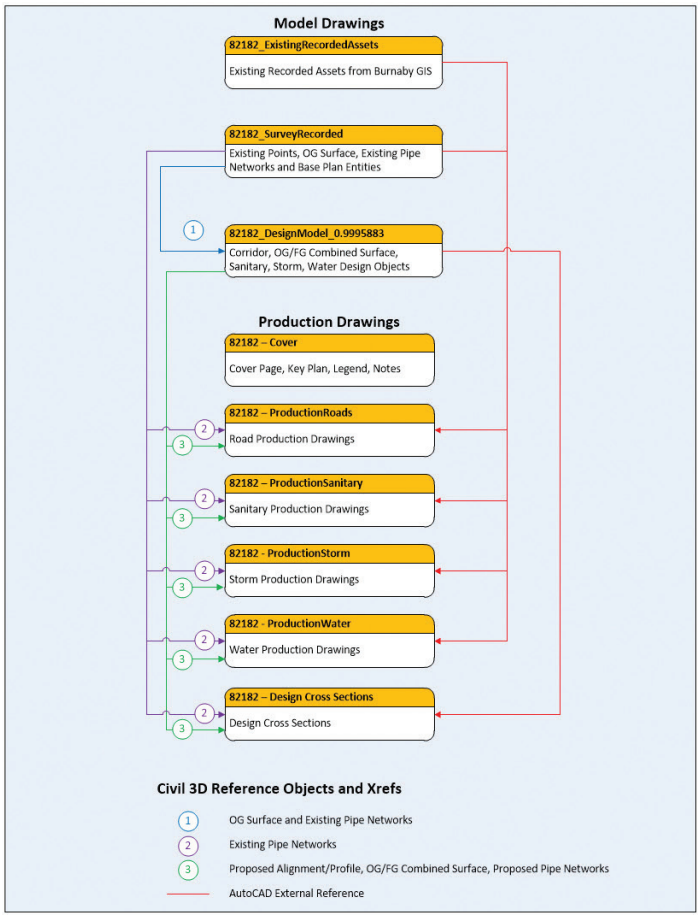
Prior to Xrefs we duplicated data using wblock and insert. This is hugely inefficient especially given the nature of the engineering industry—design change. Nowadays engineering consultants strive to develop drawing data architecture such that data is shared and not duplicated. AutoCAD Xrefs and Civil 3D data shortcuts are the primary tools to share AutoCAD graphical data and Civil 3D surface, alignment, profile, and pipe network data.

These data sharing capabilities allow designers to efficiently share data between drawings and, better yet, allow managers to make best use of staff resources on a project. With data sharing as opposed to data duplication, design changes can naturally propagate through dependent drawings.

A data structure as described not only has enormous productivity benefits, but also lends itself to post-construction submission requirements. While hard copy (PDF) plan and profiles are still the required legal and construction document, it is the spatial and attribute data represented on the engineering drawings that are of significant interest. The value is in the data.

For that reason the City of Burnaby is recommending an ACAD/C3D data structure such that design model data is in a single drawing and ideally separated from the production drawings. As long as the design model data is together, consultants have two options for drawing assembly.

1. Design model data with attributes in a single drawing with layouts showing plan and profile drawings for different project areas. While completely feasible, the disadvantages are large amounts of data for big projects and layer management required for road, sanitary, storm, and water design drawings.
2. Design model data with attributes in a single drawing that is sourced from a separate set production drawings. Data is referenced into production drawings using AutoCAD Xrefs and Civil 3D data shortcuts and reference objects.



Regardless of the chosen method it is the *data rich* design model drawing that is submitted at IFC (design recorded drawing) and post construction (constructed recorded drawing) phases of a project.

To that end it was important for the City of Burnaby to publish data assembly standards that would enable correct submissions. The recommended drawing data architecture is shown in the following illustration.

Of course, there will always be variances to drawing architecture—and every project requires a strategy for data sharing that incorporates design modeling and drawing production at the onset. The main priority to meet submission requirements is to ensure that all attributed design model drawing remains in a single file.

CONCLUSION

What started in 2009 as an initiative to develop a common AutoCAD Civil 3D-based CAD standard has rapidly evolved to become a full-fledged asset management initiative. It is the *design recorded* document that leads to the *construction recorded* (as-built) document, which is submitted to the local government for the purpose of database updates reflective of infrastructure change. After all how can a local government effectively manage assets without data? So while consistency in drawing contents and appearance has its obvious benefits, the real driver behind this initiative is the need for information.

AutoCAD Civil 3D objects coupled with other "out of the box" tools for attribution has created an excellent scenario that allows data-rich design data to be further attributed and submitted. The BC MMCD infrastructure data standards initiatives have gained significant momentum in the last few years, especially since the City of Burnaby has been involved. It is a collaborative effort between local governments, MMCD, and a little help from Provincial funding that has made this initiative so successful.

Andrew Walther is a Professional Engineer located in Comox, British Columbia. He has been an industry consultant for more than 20 years working with governments and consulting firms with civil engineering design technology and processes. Andrew is currently leading the MMCD infrastructure data standards initiatives. He is also the senior consultant on the BC Ministry of Transportation Civil 3D implementation project. He can be reached at 250.941.1422 or andrew@apwengineering.com.

by: Todd Shackelford

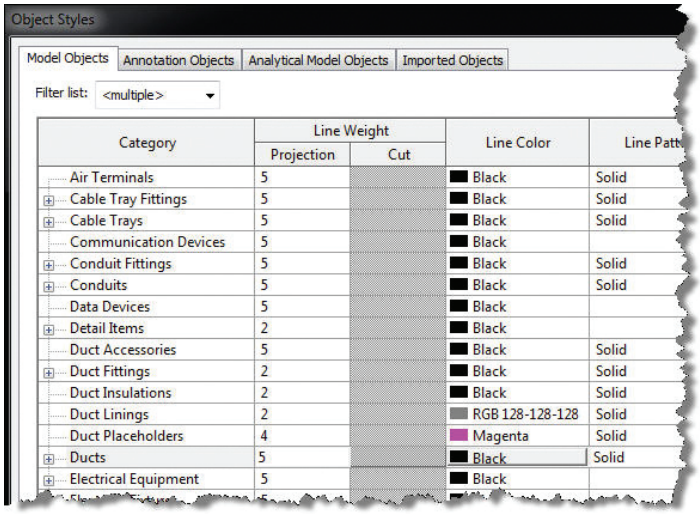
Views and Visibility

For the MEP engineer, there may seem to be too many ways to control the visibility of elements in Autodesk® Revit®. Working in a shared MEP model with architectural and structural links, things get complex and fast. With competing needs and endless options, how can a firm settle on a shared plan for visibility control? Let's start with a walkthrough ofthe basics then analyze advantages and pitfalls of the various visibility controls of Revit.

DEFAULT APPEARANCE

Line Weights

At the very base level of Revit there are line weights. Best practice is, don't change them. People have tried to match them to their AutoCAD® line weights, which seems legit, but it will cause issues when new families are created from the Autodesk template. The line weights mismatch from the families to the project template. It will hit again when linking in consultants' drawings in two ways. Number one, when linked, the architectural backgrounds will look plain wrong. Number two, the host model will also appear wrong when linked into the architectural model. At the end of the day, just use the line weights provided out of the box and skip the hassle.



Object Styles

Model Objects | Annotation Objects | Analytical Model Objects | Imported Objects

Filter list: <multiple>

Category	Line Weight		Line Color	Line Patt
	Projection	Cut		
Air Terminals	5		Black	Solid
Cable Tray Fittings	5		Black	Solid
Cable Trays	5		Black	Solid
Communication Devices	5		Black	
Conduit Fittings	5		Black	Solid
Conduits	5		Black	Solid
Data Devices	5		Black	
Detail Items	2		Black	
Duct Accessories	5		Black	Solid
Duct Fittings	2		Black	Solid
Duct Insulations	2		Black	Solid
Duct Linings	2		RGB 128-128-128	Solid
Duct Placeholders	4		Magenta	Solid
Ducts	5		Black	Solid
Electrical Equipment	5		Black	

Figure 1

Object Styles

Line weights, color, and patterns are set in the Object Styles dialog for every Revit element by category, establishing the default appearance of every Revit element (Figure 1).

Once every element has a default appearance, some thought should be given to why that default appearance should be altered and how to best do it. The usual suspects for visibility control are outlined below.

THE VIEW DISCIPLINE

Controlled by Revit, setting the view discipline for a view automatically changes the appearance of elements based on how a discipline would typically use it. In the case of views set to Mechanical, Electrical, or Plumbing view discipline:

- MEP elements display according to object styles while all other elements are half-toned and can only be selected one at a time (not window selectable).
- Ceilings in plan views will not display.
- Most MEP elements are drawn on top of other elements regardless of the location of the cut plane, except for plumbing fixtures.
- Hidden lines are only shown for MEP elements if the Show Hidden Lines view property is checked.
- Callouts, elevations, and sections display only for corresponding disciplines in plan views.

VIEW FILTERS

View filters are accessed through the Filters tab in Visibility Graphics and apply only to the views they are applied. View filters allow the user to pick out certain elements in a category based off parameters for the category. This makes view filters a good choice

for overriding subelements of Revit categories by view, by use of rules. A common use of view filters is to change the color of piping based off the piping system.

First a filter is created to isolate subelements of a Revit category or categories (Figure 2).

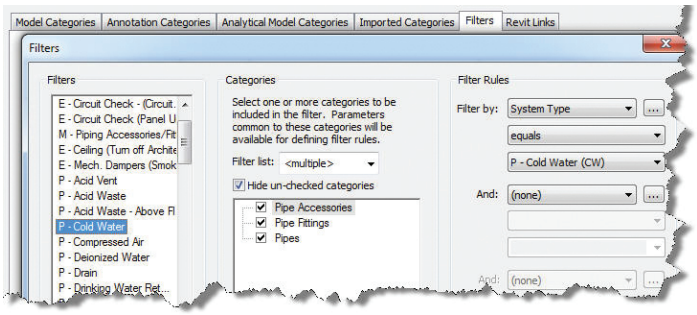


Figure 2

Then the visibility, color, pattern, and transparency of the isolated elements can be overridden and a halftone could also be applied in any view (Figure 3).

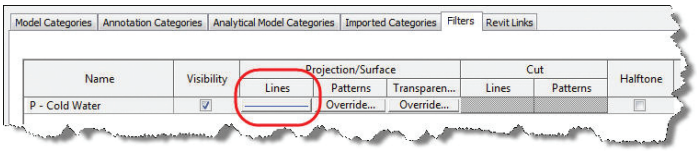


Figure 3

Because of this two-step process, the same filter can have different overrides applied in separate views, or may not be applied at all. Sometimes this is good and sometimes, not so good. The industry has been extremely creative in producing view filters to aid in visualization, design, and validation. View filters have been created to hide elements, to distinguish powered from unpowered equipment, and highlight underground circuits. There comes a point when there are too many view filters to choose from, and it is preferable to keep the number of available view filters to a manageable level. Be aware that multiple view filters applied to the same view can apply to a single element. The result is something that should show up as blue is turned blue, but is also turned off and not seen. The order that the view filters are applied will change the result, making it very difficult to diagnose problems.

WORKSETS

Using worksets for visibility control may be controversial, but it is a tool in your arsenal and should be considered. It can simplify what is seen and what is not by reducing the number of clicks and places to look for visibility. Instead of turning multiple categories on and off in visibility graphics, all categories can be turned on as long as every element is placed on the correct workset and the view is set up to only show the required worksets. Figure 4 shows how a view used for power would control filter out HVAC, plumbing, and lighting elements.

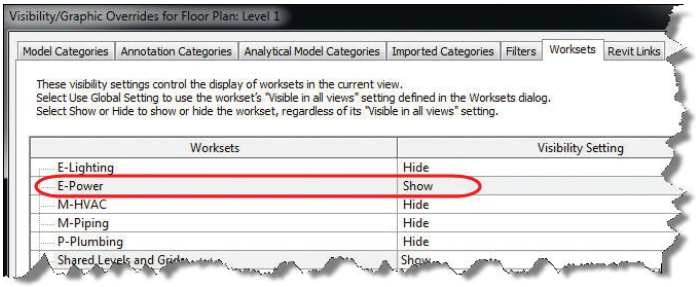


Figure 4

This method requires strict adherence to worksets, but is also one of the simplest solutions for users to understand. A con to this method is when an element is required to be in multiple contradicting views; therefore, shared worksets would have to be created. Say an electrical panel needs to be seen in power sheets as well as lighting sheets. Electrical panels should then be placed on a shared electrical workset or a background workset to be seen on every plan.

Worksets can also be handy when hiding elements in an overall plan and only showing them on enlarged plans by creating enlarged worksets. Just like filters, there reaches a point when more is no longer better.

SUBCATEGORIES

Revit provides the ability to create subcategories under program dictated categories. By assigning portions of family geometry to different subcategories, these portions can be displayed with different line weights, line colors, line patterns, and material assignments. Subtypes can also be created for equipment types, making subcategories an elegant answer to items that defy workset organization, such as mechanical equipment. A Pump may want to be on plumbing plans and power plans, but not HVAC plans. By creating a subcategory under mechanical equipment called "Pump," users can now decide if pumps or any other kind of mechanical equipment is visible, by the equipment type. Watch out for poor subcategory naming. Without strict naming standards for subcategories, projects can and will include subcategories for Pump, pumps, M-pump, Pumps, and who knows what else (Figure 5).

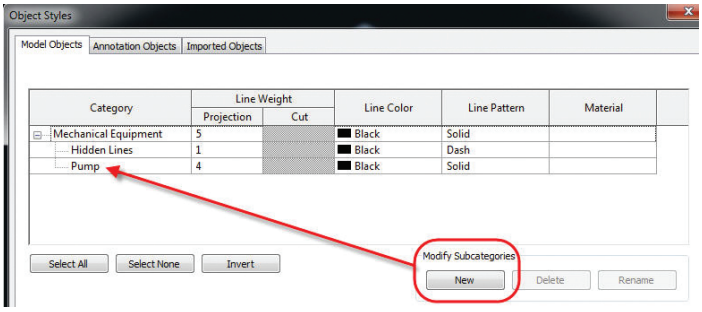


Figure 5

Another drawback to subcategories is the inability to control them as linked Revit files without digging deep into the linked project. This is shown when sharing the project outside of a firm. The receiving firm

will not have context to what the subcategories are and why they exist. Autodesk Seek has created a standard subcategory naming convention and so have other standards such as ANZRS. That being said, only your firm can say what works best for you and your clients.

VIEW TEMPLATES

View templates are Revit's way of taking anything that can affect a view and packaging it to be applied or assigned to other views. It's important to understand the options of applying a view template and assigning one. When a view template is applied to a view it is a onetime setting that will not lock in. If the template is altered, no changes will reflect in the view, nor will an applied view template stop users from making view changes after the template is applied. To apply a view template, go to the View tab of the ribbon, select the View templates drop-down, and pick "Apply Template properties to Current View" (Figure 6).

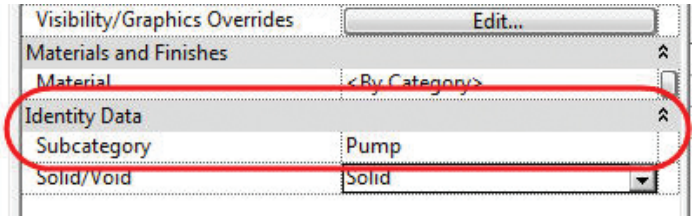


Figure 6

An assigned view template locks users out of making changes to the view that are dictated by the template. Instead, the user must alter the template itself. Altering the template will in turn push those changes to each view that the template is assigned to. To assign a view template, choose the template under Identity Data in the view properties (Figure 7).

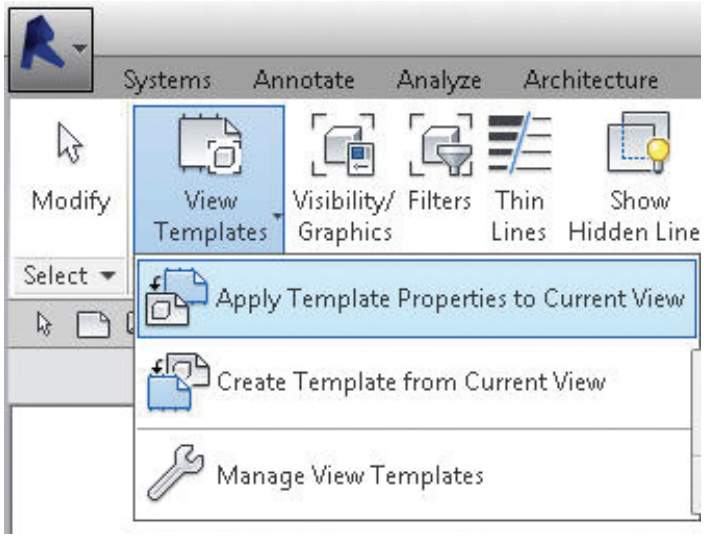


Figure 7

So when to apply and when to assign? It might be easiest to just ask the question, "Does this template need to be associated with more than one view?" If that is the case, assigning is the way to go. By assigning the template the user can be assured that each view that calls this template will have an identical setup, and that setup can be refined over time by altering the template. For one-off situations, applying the template can quickly get the user to a great starting point, and leave the user free to tweak the visibility setting without having to navigate the template further.

Taking things a step further, it can make sense to do both. Templates can be assigned to control the linked architectural and structural files. Then a separate template can be applied to control the host file for discipline specific setups such as lighting, plumbing, and HVAC. In this way each discipline will work off an identical background, but also have the discipline-specific control of the view. In cases like this, the user may find that the applied discipline view template may need to be updated as the project progresses and reapplied. This is easily done by selecting all the appropriate views in the project browser, right clicking, and selecting "Apply Template Properties…."

HIERARCHY OF VISIBILITY

There are still many more parts of Revit that effect visibility and further complicate things in a single file. Once worksharing and file linking are added to the mix, it becomes difficult to remember which rules apply and why something is being seen or not seen. Understanding the hierarchy of Revit visibility can help the user sort out what went wrong. The higher numbers in the list below trump the lower numbers.

1. Project Object Styles
2. VG Overrides
3. Phasing Overrides
4. View Filters
5. Override Graphics in View by Element
6. Override Graphics in View Halftone

How to best leverage these techniques to work for your firm's processes may take a bit of trial and error. In general, Object Styles should lock in the defaults, then Worksets can be used to limit unneeded elements. View Filters are used to change the appearance of elements by system or condition. Subcategories can be used to refine the visibility of elements shared by multiple disciplines and help limit the number of view filters. Wrap it all up in applied and assigned view templates to ensure consistency and you have a functional approach that is easy for users and support.

Todd Shackelford is the BIM Manager for Leo A Daly, a University of Nebraska instructor and a founding member of the Omaha BIM Collaborative and the Revit Workshops. He authors two Blogs: CAD Shack and The Lazy Drafter. A Revit 2013 Certified Expert. Todd looks for his missing socks when not otherwise committed. Tweet Todd @ShackelfordTodd or email Todd at tmshackelford@leoadaly.com

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Notable statistics about AUGI's Wish List this year
Number of open wishes: 6933
Total Votes: 88,057
% of Votes for AutoCAD/
AutoCAD-based products: 46%
% of Votes for Revit-based products: 45%
Total Rankings: 191,592
https://www.augi.com/wishlist

Thank you to AUGI and their members who participated!

AUTOCAD

#	Submitter	Wish Title
1	Yair Yes	Lock Drawing Order of Specific Objects
2	Carey Edwards	Improve Search Results in AutoCAD Help
3	Remondo Mak	Open Model and Layout Tabs on Different Monitors
4	Mark Wallner	All Pop-Up Windows to be Resizable
5	Richard Farlow	Set Osnap Priority

#	Submitter	Wish Title
6	Steve Weichel	Listing of Blocks and Their Properties
7	Anita Nichols	Set Format of Copied Text
8	Stefan Botman	Restore Performance to Match Earlier Version's Performance
9	Jason Herringe	Dynamic Blocks in Multileaders
10	Greg Silva	Selection Window to be Parallel with Current UCS

AUTOCAD ARCHITECTURE

#	Submitter	Wish Title
1	Nathan Ellery	Update & Improve Roof Object Tool
2	Nathan Ellery	Improve Slabs
3	Nathan Ellery	Improve Doors
4	A. K.	Convert Detail Component Manager Dialog to a Palette
5	Matthew Dougherty	Dynamic Array Settings

#	Submitter	Wish Title
6	Ben Fruehling	Support Drawing/Layout Tabs on Multiple Monitors
7	Fabrice Maicel	Split Selected Cells on Curtain Walls
8	Melinda Heavrin	Walls Under Style Manager/Display Properties
9	Ahmed Khamies	Full Detailed Sections
10	Cinzia Milioli	Graphics Property for Schedules

CIVIL 3D

#	Submitter	Wish Title
1	Sebastien Leonard	Stop Any Process No Matter How Long
2	Chris Brenton	Lock Inverts and Slopes at Points of Interest
3	Sebastien Leonard	Upgrade Osnap Functionality
4	James Lord	Dynamically Link Feature Lines Created via Stepped Offset
5	Aaron Litteken	Unified Edit Command

#	Submitter	Wish Title
6	Steve Boon	Linetype Generation on Feature Lines
7	Mike Lapointe	Smarter Grading Objects
8	Cyndy Davenport	Create Civil 3D Deliverables
9	Sonia Borba	Linetype Generation in Profiles
10	Jason Kroll	Transitions Between Assemblies in Corridors

INVENTOR

#	Submitter	Wish Title
1	Jim Durkin	Better Support for Multi-Core Processors
2	Kendred Cooper	More Detailed Error Messages
3	Maarten Verbunt	Migration of Settings to New Release
4	Paul Scirpo	Highlighting a Constraint Error in an Assembly
5	Xavier Venisse	Show the Other Source of Constraint Conflicts

#	Submitter	Wish Title
6	Josh Hunt	Assembly Insert Constraint and Lock Rotation
7	David Salyer	Calculate the Volume of a Container
8	Cape Fear AMUG	Save Mirrored Part as Fully Constrained Copy
9	Sam Sather	Negative Sketch Dimensioning
10	Brian Burch	Add Kwikset Functionality to Inventor

NAVISWORKS MANAGE

#	Submitter	Wish Title
1	Colin Magner	Multi-User Reviews of Models
2	Brooks Williams	Run Clash Tests Only on Visible Objects
3	Daron Denton	Zone Based Clashing
4	Joe Perkins	Improve the Find Items Dialog
5	Joe Perkins	Selection Tree Folders

#	Submitter	Wish Title
6	David Mettler	Multi-Core Rendering
7	Chris Grochowski	Improve Measurements in Navisworks
8	David Moody	Reveal Hidden Elements
9	Nick Ambrosino	More Clash Report Customization
10	Tad Wirmel	Reference Manager in Navisworks

AUGI Wish List 2015

REVIT ARCHITECTURE

#	Submitter	Wish Title
1	Hans Andrasko	Family Browser Enhancement
2	Eric Maguire	Import PDF Files
3	James Raesly	Automatic Line Weights for Elevations
4	Brian Hadley	Graphically Create Fill Patterns
5	Rick Bulic	Sloping Walls

#	Submitter	Wish Title
6	Jeremy Evard	Give the Default 3D View a Perspective Toggle
7	Eldad Asoulin	Better Schedule Sorting & Printing
8	Ross Karp	Join Geometry to Work on Stairs
9	Crispin Schurr	Improved Filter Selection Tool
10	David Duarte	Reassociate Objects on Deleted Levels

REVIT MEP

#	Submitter	Wish Title
1	Daniel Rodriguez	Create Coordinated Single-Line Diagrams
2	Colin Magner	Space Elements to Cope with Vertically Irregular Spaces Better
3	Nick Crane	Connectors Across Linked Models
4	Colin Magner	Tell Us Why Our Systems are not Well Connected
5	Aaron Bulla	Add a Footer/Notes Section to Schedules

#	Submitter	Wish Title
6	Daniel Rodriguez	Calculate Length of Connected Run
7	Le Hien Huynh	Duplicate Sheets
8	Eric Kuszewski	Improve Plan Regions for MEP Elements
9	Kevin McGlothlin	Improve Pipe Rise/Drop Symbology
10	Marty Pieszala	Text Editor

REVIT STRUCTURE

#	Submitter	Wish Title
1	Rick Blankenship	True Piers and Grade Beams
2	Shaun Peppers	Grade Beam Object Class
3	Arnout van Ijsseldijk	Tag Alignment at All Angle
4	Rebecca Frangipane	Revision Cloud Sketch
5	S. Watts	Reference Tags in Text

#	Submitter	Wish Title
6	Evalucia 2000	Keep Override When Dimension Change
7	Richard Mitchell	Add a System Pier Family
8	Shaun Peppers	Automated Beam/Column Connections
9	Steve Saltsman	Tag Any Elevation
10	T T	Import Excel and PDF files

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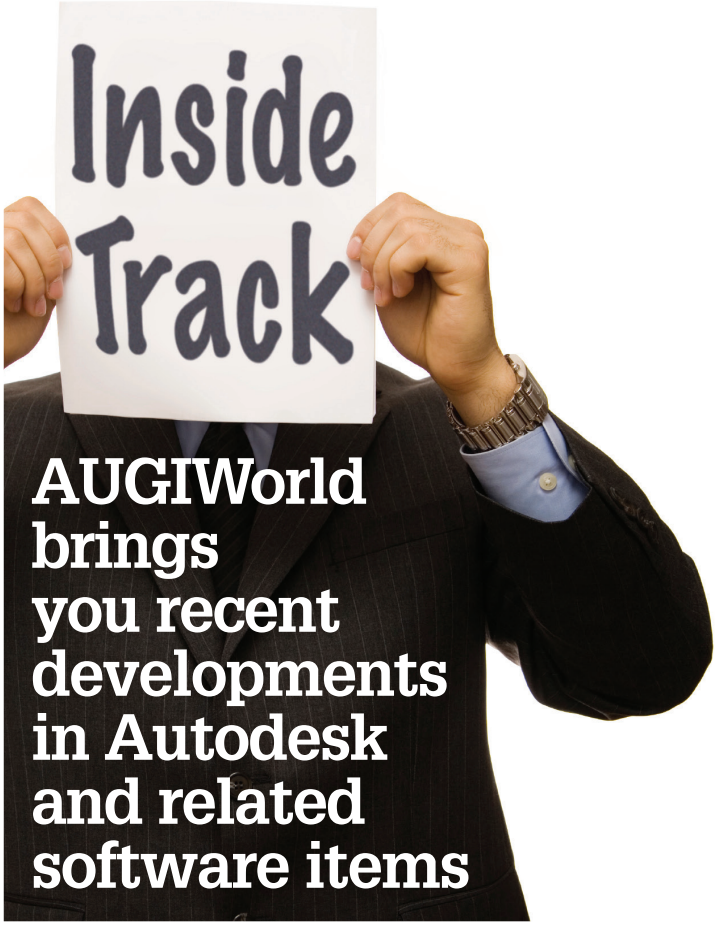

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