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AUGI World

What's New for 2011?

Table of Contents

AUGIWorld

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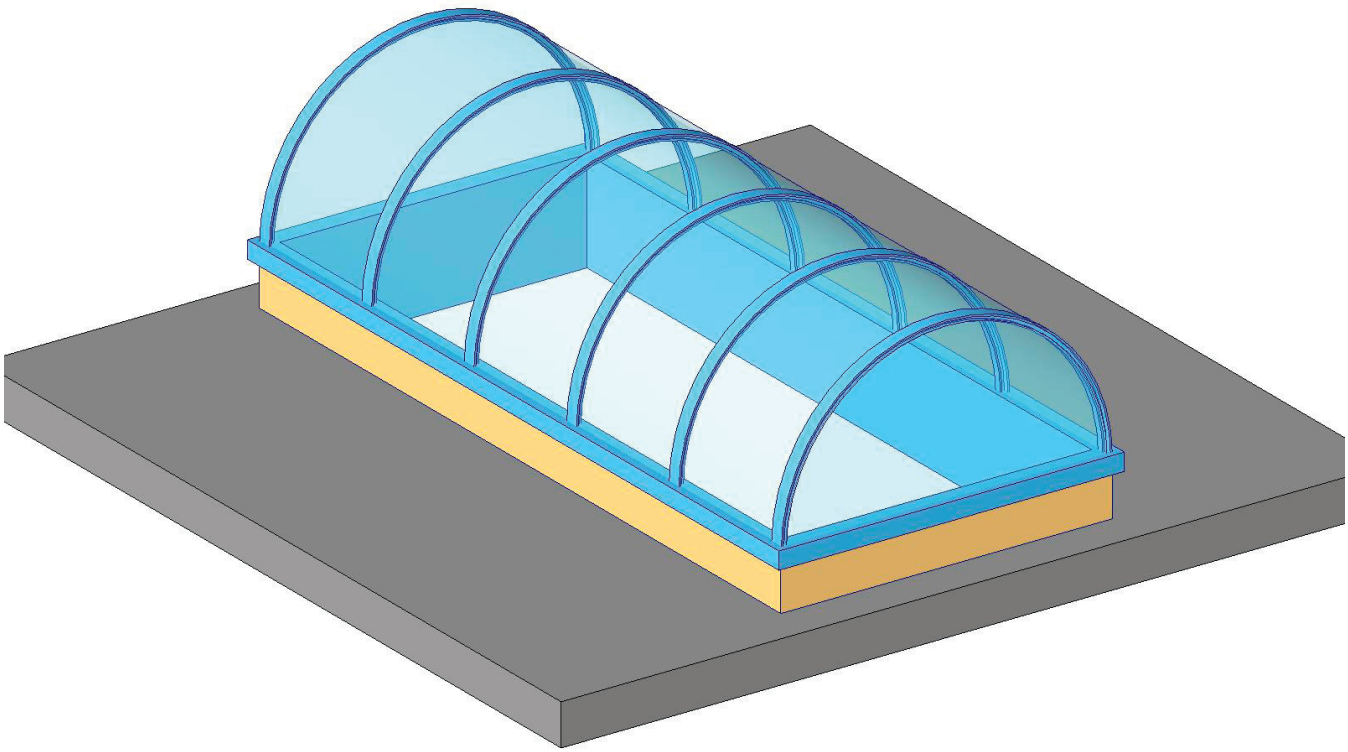

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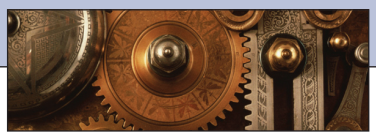

Autodesk Advances with New Product Releases

I was invited to the AutoCAD® 2011 launch event in San Francisco, where bloggers and other independent voices gathered to see the newest release of AutoCAD. So while Autodesk dutifully demonstrated AutoCAD 2011, we saw a lot more than that. Autodesk unveiled its new releases of AutoCAD® Architecture and Autodesk® Revit®, discussed what's new at Autodesk® Labs, and more. The products presented at the event were strong and progressive. The effort Autodesk puts into a single release is overwhelming. Here is an example.

For AutoCAD 2011 – 76,000 man hours in QA testing which includes:

- 6000 total code reviews
- 2000 commands tested
- 4600 Beta customers

1.4 million lines of code were removed (did you get that? – REMOVED).

I look forward to seeing how this much effort and testing by so many make for a stable product that has a reduction in footprint based on less code bloat.

This event also allowed me time to ponder what Autodesk is up to and where the company is going. Here are some reflections on the event and the state of Autodesk software development.

1. **The products are innovative.** I see a continuation of creative ideas in mature products. It may seem easy to add features to newer products that are growing into their markets, but to add more features to a product that was introduced in the 1980s (AutoCAD) is encouraging. They keep perfecting and improving on the tools that have been around for a long time.

2. **Autodesk listens to its customers.** The company pays close attention and produces on the feedback it gets. I know this because of the new features they add to the software. Every release has things I never considered—things that collectively make the products stronger. Some are obvious, but the ones that were added to the base platform, AutoCAD, are small refinements that enhance the product even when we all think it is mature. Actually, some of the enhancements to AutoCAD 2011 are huge, depending on your use of the tool.

   You might disagree with me and think that the major changes that need to be made are missing. You might think that the product has major holes that remain unfilled. But if you look at the general advancement of the tools, there is much progress. Autodesk might not have fixed the items that interest you, but there are some major upgrades and enhancements to just about every product. Somewhere out there are very happy users who are pleased with this upgrade.

   But if you are one of those who thinks there are some major problems to be addressed, then speak up. Continue to let Autodesk know what you think needs fixing. Do it via the AUGI Wish List process and via the AUGI forums.

3. **The software is not perfect and Autodesk knows it.** I am not saying that Autodesk ships flawed software—far from it (see number 4 below). What I mean is that the developers know they have to continue working on it and they are. No product has been left to languish. All of them have focused teams who look for improvements and deliver. Some products do disappear. From the outside looking in, it seems to be based on market share. Smaller tools with few markets tend to fade away. Others are replaced or eclipsed by new tools. Some of the most interesting tools have come and gone, but glimpses of them show up in other software. I remember Architectural Studio. Do you? It is gone, but I see bits and pieces of it in other tools. Have you seen Alias Sketch for AutoCAD? Déjà vu?

4. **Autodesk goes to great lengths to ensure that the products are stable.** I spent some time with the Q&A team for AutoCAD 2011. They are devoted to the product and have an extensive process of weeding out the issues that will impact end users. Rigorous testing goes into the product. Extensive testing and retesting. All of this is done to help make the products stable. They can and have delayed releases of software that have not made the cut. The quality team at Autodesk is a vibrant, focused group that really stands up for the end user getting a stable product. I applaud them.

5. **Autodesk is mixing and matching software.** The company realizes that you use several different tools to get the job done. They are moving to provide cross-pollination among products. They have moved toward interoperability between products as an effort to assist end users. They have bundled products that users tend to use together. They have bundled 2D with 3D packages as an incentive to move to 3D. They now offer suites of

products under one collective product line, bundling AutoCAD to the vertical products such as Revit and Autodesk Inventor®. We should be looking for these encouragements to continue.

It is not all roses and sunshine coming from Autodesk. There is a lot of progress still to be made. Here is my short list of what Autodesk developers need to continue to refine.

1. Large firm issues of sharing work on the WAN. Those firms that have multiple offices and are splitting work between them understand this issue. Getting a team to work seamlessly across large geographical areas is not fun, but it is reality. Most firms are sharing resources (people and talent) from one office to another. Opening, working, and saving files on a remote server is no picnic. Autodesk needs to address this with full vigor.
2. Small firm issues are related to cost and upgrades. With limited funds and smaller support teams (if any), moving from one release to another is a major hurtle. This problem is not limited to Autodesk, but is an issue with all software.
3. Education needs to be addressed. I don't know about your market, but I am seeing more early career employees enter the job market with very little or no hands-on training in the basic tools. AutoCAD training is disappearing from high schools and community colleges. Universities have few classes on CAD. Hands-on 3D is being taught, but not to the level of producing constructible sets of drawings. Autodesk should embrace and extend educational grants (which they do provide) so that all levels of education have access to CAD tools. Kindergarten CAD, anyone?
4. Retain the Autodesk Assistance Program for displaced workers and students. This is great. If you are a displaced worker, you can get training and software to increase your marketability and skills. Training and software are provided. Go to http://students.autodesk.com to find out more about the offerings for students and faculty. If you are a displaced worker – check it out at http://students.autodesk.com/?nd=assistance_home

   Benefits include:
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   Contact your local Autodesk Authorized Value Added Reseller for more information about this and other programs.

There are many things that Autodesk is already improving and can improve on in the future. Only through your voice and participation in these efforts will they know what you want and what you appreciate. Get heard by going to www.augi.com and speaking up.

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

When the Going Gets Tough

In the last two issues of *AUGIWorld*, I wrote about hiring practices in tough economic times. I would like to thank Karen A. Vagts for her amazing book *Managing AutoCAD in the Design Firm: A Manual for Architects and Interior Designers*, from which I drew inspiration for my previous articles. Though written 14 years ago, Vagts' concepts hold true today.

In this article, I will reference the work of other authors to explain how to work with difficult professionals in a CAD environment.

Who has never worked with a temperamental colleague or had under his/her command a difficult professional? We can easily spot the workaholic personality, or the pessimists who are against any change, or the grumpy ones, who ignore "good neighbor" politics. Their knowledge and talent are diminished by their unsuitable behavior. Still, they are there—at least for now—and you must learn to deal with them.

Dealing with Difficult People was written by Dr. Rick Brinkman and Dr. Rick Kirschner, authors of several books on the subject. According to Brinkman and Kirschner, there are four basic options to deal with the problem.

- **Stay and do nothing.** Doing nothing is not necessarily complete passivity; it may include both suffering and complaining to other people who can do nothing. Doing nothing is dangerous, because frustration with difficult people tends to build up and grow worse over time. Complaining to people who can do nothing tends to lower morale and negatively impact productivity, while postponing effective action.
- **Vote with your feet.** Sometimes your best option is to walk away. Not all situations are resolvable and some are just not worth resolving. Voting with your feet is wise when it no longer makes sense to continue to deal with the person. If the situation is deteriorating, if everything you say or do makes matters worse, and if you find yourself losing control, remember that discretion is the better part of valor. Walk away. Eleanor Roosevelt said, "No one can make you feel inferior without your permission." Before you decide to walk, however, you may want to consider your two other choices, described below.
- **Change your attitude.** Even if the difficult person continues to engage in the difficult behavior, you can learn to see the person differently, listen to the person differently, and feel differently about the person. You can make attitude changes that will set you free from your reactions to problem people.
- **Change your behavior.** When you change the way you deal with difficult people, they have to learn new ways to deal with you. There are effective, learnable strategies for dealing with most problem behaviors.

These authors have identified the 10 most unwanted behaviors that people resort to when they feel threatened or thwarted. These represent their struggle with (or withdrawal from) undesired circumstances.

1. **The Tank:** Pushy and ruthless, loud and forceful, or with the quiet intensity and surgical precision of a laser, the Tank assumes that the end justifies the means. If you are in the way, you will be eliminated.
2. **The Sniper:** This covert operator resents you for some reason. Instead of getting mad, he or she gets even by identifying your weaknesses and using them against you through sabotage, gossip, and putdowns.

3. **The Grenade:** This person explodes in tantrums that seem disproportionate to the present circumstances, sending others ducking for cover and wondering what it's all about.
4. **The Know-It-All:** This person knows 98 percent of everything (just ask!). Know-It-Alls will tell you what they know—for hours at a time—but won't take a moment to listen to your "clearly inferior" ideas.
5. **The Think-They-Know-It-All:** Although these people don't know that much, they don't let that get in the way. If you don't know much about what they're talking about, they may lead you into trouble or throw a project off track.
6. **The Yes Person:** Quick to agree, slow to deliver, the Yes Person leaves a trail of unfulfilled commitments and broken promises. Although they please no one, Yes People over-commit to please.

7. **The Maybe Person:** When faced with a crucial decision, the Maybe Person keeps putting it off until it's too late. Finally, there comes a point when the decision makes itself.
8. **The Nothing Person:** You can't know what's going on because the Nothing Person tells you nothing—no feedback—verbal or nonverbal.
9. **The No Person:** This person says, "Every silver cloud has a dark lining" and "I'm not being negative, I'm being realistic." Doleful and discouraging, the No Person drives others to despair.
10. **The Whiner:** These people wallow in their woe, whine incessantly, and drag others down with the weight of their generalizations that nothing is right, everything is wrong, and it's always going to be that way unless you do something.

In the book *Maximum Success: Changing the 12 Behavior Patterns That Keep You From Getting Ahead*, authors James Waldroop and Timothy Butler cleverly use simple scenarios and business cases to address the origins of the problem and pattern. They explain why the behavior patterns may limit your career advancement and how to break the behavior patterns.

To help readers understand and remember the 12 behavior patterns or "bad habits," the authors name them as follows:

- **Acrophobe:** Feeling in their heart of hearts that they don't deserve to be where they have been placed.
- **Meritocrat:** Seeing the world in black and white, with answers that are right or wrong, all weighed on a perfectly fair scale and judged accordingly, on their merits alone.
- **Hero:** Constantly trying to do too much and pushing themselves and others too hard.
- **Peacekeeper:** Going out of the way to avoid conflict because of uncertainty about how it will end up.
- **Bulldozer:** Talking and acting tough, bullying people, taking no prisoners, and leveling anyone and anything that gets in the way.
- **Rebel:** To defy authority and everything associated with authority, including societal tradition, company custom, and good taste.
- **Home run hitter:** Expecting and demanding extraordinary and immediate success.
- **Pessimist-Worrier:** Seeing the negative and almost nothing but the negative; then worrying about it to excess.
- **Mr. Spock:** Having a hard time recognizing and understanding fear, love, anger, jealousy, greed, compassion, and other emotions in themselves or in others.
- **Coulda-been:** These people have very little tolerance for hard work and little patience, not because they're lazy, but because doing the work to get to the top means that they're not already there. When they seem to be saying is "No job is good enough," but what they actually feel inside is "I'm not good enough for any job."
- **Loose Lips:** The person who lacks an appropriate sense of boundaries doesn't understand that some subjects belong in the office and some belong only in certain corners of the office and definitely not outside.
- **Dig Deeper:** Feeling they have lost their sense of direction, or a sense of enthusiasm that has dimished or disappeared for reasons that are not immediately clear.

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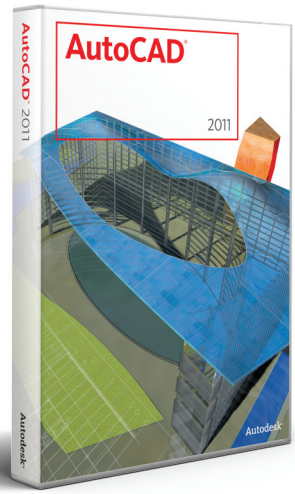
What's New in AutoCAD 2011?



Spring is upon us, and we all know that springtime is when everything is new. I'm not just speaking about plant life either; I'm also referring to our AutoCAD® software. For the last six years Autodesk has made good on its commitment to a 12- month release cycle, and this year is no exception.

This spring saw the release of AutoCAD 2011, and just when you thought they couldn't squeeze any more "big ticket items" into this program, AutoCAD 2011 adds a couple more. In addition to the new "major features," several of the existing tools have also been updated and improved.

All in all, the improvements made to AutoCAD 2011 are sure to make you more productive and bring a smile to your face as well. Let's take a look.

User interface tweaks

In this, the third release since launching the Ribbon interface, AutoCAD 2011 makes some small refinements to the overall drafting environment.

At first glance, you'll notice the color of model space has reverted back to a more "classic" look. The new dark gray color provides a much better contrast against most of the standard layer color choices.

The model space grid gets a makeover in AutoCAD 2011; it now has the appearance of engineering graph paper. The updated grid displays red and green lines to identify the positive portion of the X and Y axes.

In the upper right corner, you'll find the ViewCube making its debut in the 2D wireframe view (see Figure 1). Its clockwise/counter clockwise controls can make quick work of rotating a model space view, or the contents of a paper space viewport.

A new Navigation bar has also been added to the interface (see Figure 1) The Navigation bar contains frequently used navigational tools. While this toolbar may not be your first choice when navigating a drawing, (Pan, Zoom, and Orbit can also be accessed using the scroll wheel) the Navigation bar is a great shortcut for those working on a laptop or netbook without the benefit of a mouse.

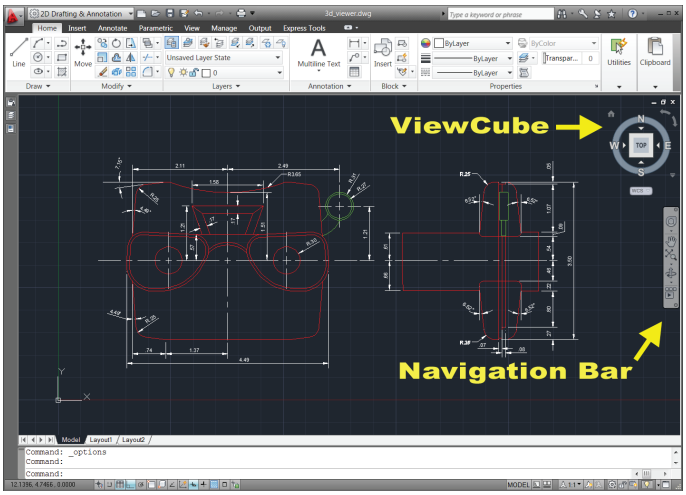


Figure 1: AutoCAD 2011 interface.

Introducing transparency

Transparency is finally a reality in AutoCAD 2011 and I must say I appreciate the way it has been incorporated into the program. Often transparency is thought of in the context of hatch objects. Rather than "limiting" transparency to a hatch setting, AutoCAD 2011 implements transparency as a general property, much like color or linetype. This means we have a choice. We can apply transparency to specific objects OR we can apply transparency to an entire layer.

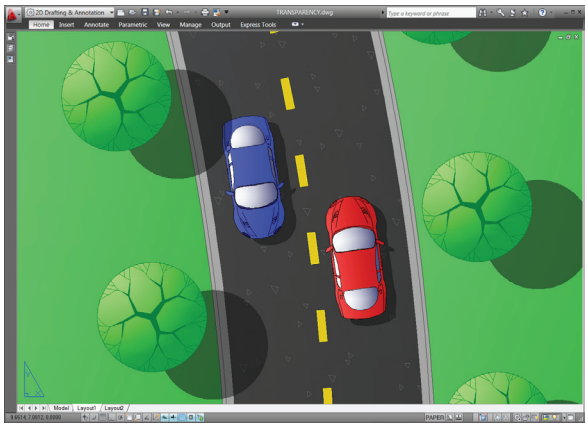


Figure 2: AutoCAD's new transparency property provides more creative freedom in design presentation.

This new transparency property can open up a world of creative possibilities (see Figure 2). Imagine using transparent hatch to colorize portions of an aerial photograph. Imagine screening back geometry on your plots by simply applying a 50 percent transparency to the layers.

To control whether transparency displays on printed drawings, a new "Plot transparency" setting has been added to the plot dialog box. (Note: This setting will increase plotting time, so if your drawing isn't using transparency, leave this option turned off.)

Dynamic hatch creation & editing

All of the hatch settings in AutoCAD 2011 have been incorporated into a new Hatch Creation tab on the Ribbon. This means we never again have to jump back and forth between a dialog box and a hatch preview!

When creating hatch via "pick point," simply move your cursor into an area to see

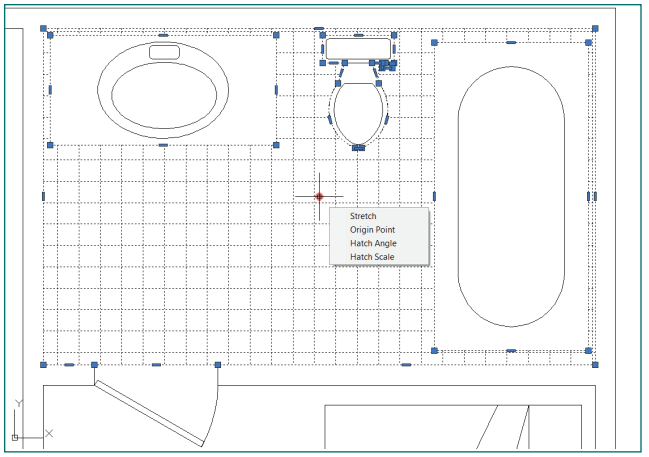


Figure 3: The direct manipulation grip allows hatch to be dynamically modified on screen.

an instant hatch preview prior to making a selection.

Editing hatch has also become much easier. Selecting a hatch pattern will automatically display the Hatch Editor tab, giving you access to all available hatch settings. A new direct manipulation grip has also been added (see Figure 3). This grip displays when a hatch object is selected and it allows you to dynamically drag the origin, angle, or scale of the hatch on screen.

Streamlined parametric constraints

If you've ever applied geometric constraints to your linework, you know it's a two-step process. First, you create your geometry, and THEN you come back and assign the constraints.

AutoCAD 2011 allows us to cut our work in half with the new Infer Constraints toggle in the status bar. When Infer Constraints is turned on, AutoCAD will watch our object snap choices as we draw and apply geometric constraints automatically. Using Endpoint, Midpoint, and Center snaps will automatically apply a coincident constraint between entities. Perpendicular, Parallel, and Tangent snaps will also create the appropriate geometric constraints.

Draw a vertical line using Ortho, and the line will automatically have a vertical constraint applied. Fillet two line segments, and the resulting arc will have coincident and tangent constraints applied, tying the arc to the adjoining lines.

Improved polyline editing

In AutoCAD 2010, multifunctional grips were added to hatch boundaries to make them easier to edit. In AutoCAD 2011, the multifunctional grip concept has been expanded to polylines. This means we can now edit the geometry of a polyline intuitively on screen.

Selecting a polyline displays two types of grips; primary (located at endpoints) and secondary (located at midpoints). Hover over a primary grip, and you'll see a menu allowing you to Move/Remove or Add another vertex. Hover over a secondary grip and you can convert that segment into an arc or line, as well as create another vertex. Editing the geometry of a polyline has never been easier.

Text alignment in linetypes

Whenever you incorporate text into a linetype you have to be mindful of the readability of the text. The introduction of the Reverse command in AutoCAD 2010 helped in this respect because it allowed us to quickly change the direction of our linework. AutoCAD 2011 goes one step further by incorporating an "upright" setting within the linetype definition itself. This means our geometry can be created at any orientation and the text will automatically maintain readability (see Figure 4).

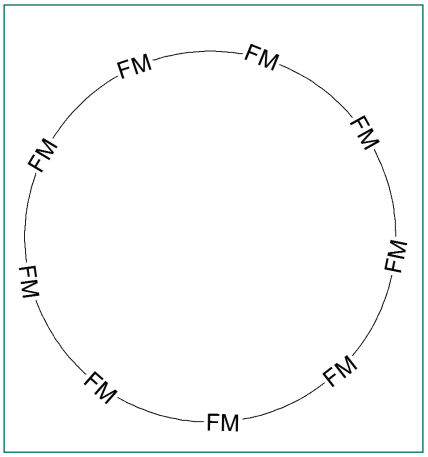


Figure 4: AutoCAD 2011 linetypes will maintain readability regardless of orientation.

All linetypes included with AutoCAD 2011 (or created with 2011) behave this way by default. Applying the new setting to your own custom linetypes requires a minor change to the linetype code. (Press F1 for help, and use the keyword "upright" for instructions.)

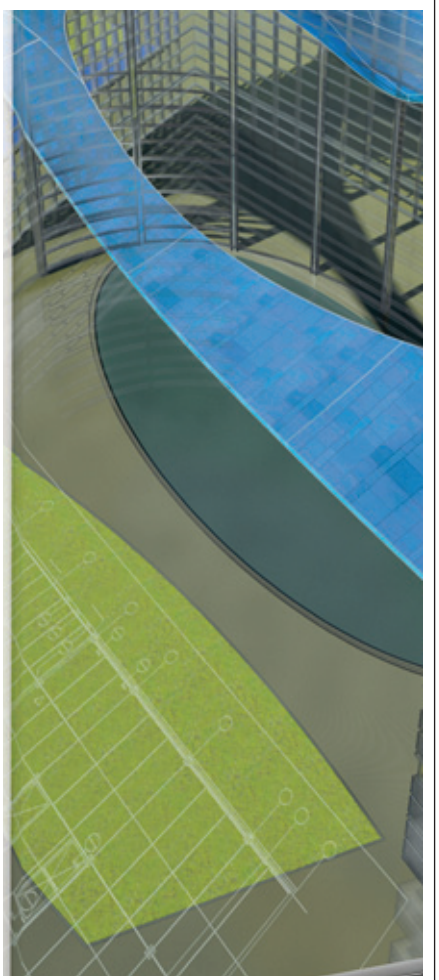
Enhanced surface modeling

Over the years, surfaces have taken a back seat to some of the other 3D creation tools. This has happened because, historically, surfaces have been difficult to edit. Well, AutoCAD 2011 has breathed new life into surface modeling with an entire Ribbon tab filled with tools for creating, editing, and analyzing surfaces.

First of all, AutoCAD 2011 provides two types of surface objects, Procedural and NURBS (non-uniform rational b-spline). Procedural surfaces are associative, meaning they maintain a relationship with the geometry that created them. Change the geometry, and the surface updates automatically. NURBS surfaces are non-associative; they are edited by pushing and pulling on control verticies. NURBS surfaces are a perfect choice for modeling freeform organic shapes.

Creating surfaces is easy. In addition to the "standard" surface creation tools such as Extrude, Revolve, Loft, and Sweep, AutoCAD 2011 includes several new tools like Blend, Patch, Network, and Offset.

Once surfaces have been created, they can be easily trimmed, extended, or filleted using the tools available on the Surface tab (see Figure 5). Depending on the creation method, many of a surface's geometric properties can also be modified using the Property Changer palette.



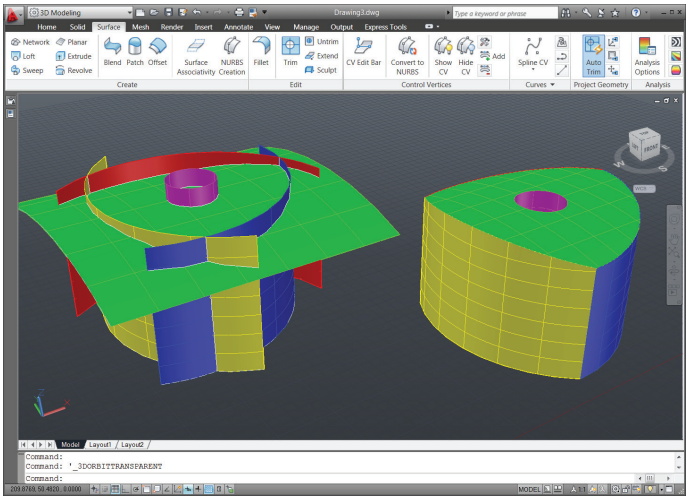


Figure 5: New surface objects are easily edited to create more complex shapes.

Finally, AutoCAD 2011 offers a series of analysis tools to help you identify and review surface continuity, high and low areas of curvature, and draft angles.

Improved render material management

If you create photorealistic renderings of your models, you've probably wished for a better way to find, organize, and edit render materials. AutoCAD 2011 solves this material "management" problem by introducing the new Materials Browser. The Materials Browser is a one-stop-shop for viewing, selecting, and editing materials (see Figure 6).

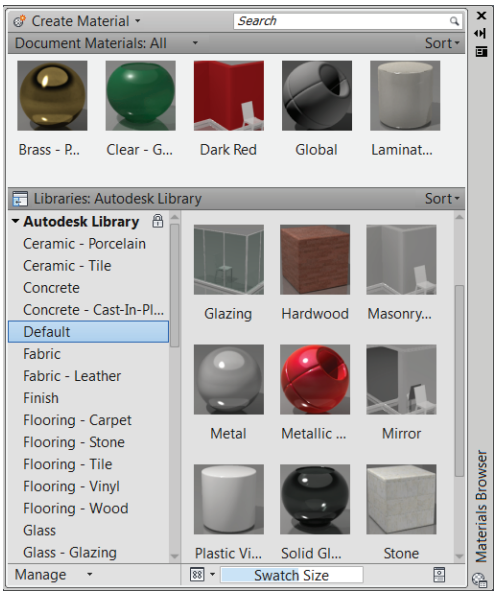


Figure 6: Materials Browser offers improved selection and management of render materials.

Using the Materials Browser, finding the perfect material is as easy as choosing a major category on the left, and then browsing through the available swatches on the right. For a more specific search, you can enter keywords such as "ceramic" or "red."

The materials you select are displayed at the top of the browser, where they can be applied to objects using drag and drop, or by layer.

To edit the properties of a material, double-click on the swatch to launch the Materials Editor. From here you'll find settings that control color, texture, finish, reflection, and so on. The amount of settings you see will depend on the type of the material you're editing. (You probably wouldn't need a refraction setting for ceramic tile!)

If you create photorealistic renderings of your designs, I'm sure you'll agree that the new Materials Browser is a welcome addition that will make you a more efficient "material manager."

Other drafting enhancements

In addition to the major features we've discussed, there are many additional tools included in AutoCAD 2011. Here are just some of the other features you may find helpful.

Select Similar – Select an object (right-click) and use Select Similar to automatically select all other objects of the same type that share the same properties.

Selection Cycling – Selection Cycling is used to easily choose between multiple overlapping entities. (Toggled on/off in status bar.)

Add Selected – Select an object (right-click) and use Add Selected to create a new object with similar properties.

Isolate/Un-isolate Objects - Use this tool to isolate entities independently of layer settings. (Can be found in the right-click menu after selecting objects.)

Enhanced Spline Control – Splines can now be defined using fit points or control verticies. Existing splines can easily be edited using multi-functional grips.

Improved Constraint Management – The Parameters Manager includes a new Filters pane where you can organize parameters into logical groups.

3D Object Snaps – New object snaps have been added for 3D modeling. A toggle has also been added to the status bar for 3D running object snaps.

More Visual Styles – AutoCAD 2011 provides five new visual styles: Shaded, Shaded with Edges, Shades of Gray, Sketchy, and X-Ray.

New Mesh Modeling Tools – The faces of a mesh object can now be merged or collapsed. If the mesh has a hole in it, the Close Hole tool can be used to close the gap.

Point Clouds – AutoCAD 2011 enables you to attach and display point clouds created from 3D scanning devices.

Online Help System – AutoCAD 2011 includes a web-based help system. In addition to standard help content, a search also provides links to learning resources as well as Knowledge Base articles related to your topic.

Conclusion

AutoCAD 2011 provides a wide array of new tools for both 2D and 3D work. The transparency property alone could make this a "must have" release for many users. Transparency is a tool that can mean the difference between a good presentation and a great one.

Those who work primarily in 2D will appreciate the time savings generated by more powerful selections, faster creation of hatch/geometric constraints, and the streamlined approach to editing polylines, splines, and hatch objects

Those who work in 3D will love the new surface modeling tools. AutoCAD 2011 marks the "comeback" of the surface object as means of visualizing a conceptual design. Coupling the updated surface objects with the new Materials Browser will make AutoCAD 2011 a very attractive release to the 3D designer.

To get a better idea of how AutoCAD 2011 can work for you, download the trial version at http://www.autodesk.com/autocad or contact your local reseller.

Jeff Bartels is the Sr. Engineering Technician for WBK Associates and works with AutoCAD Civil 3D and AutoCAD. He is the author of eight AutoCAD training titles for Lynda.com. Jeff is also on the faculty at Elgin Community College in Illinois, where he teaches the Advanced AutoCAD courses. Jeff can be reached via e-mail at jbartels@realworldcad.com. Follow him on Twitter – JeffBartels, where he regularly posts AutoCAD tips and shortcuts.

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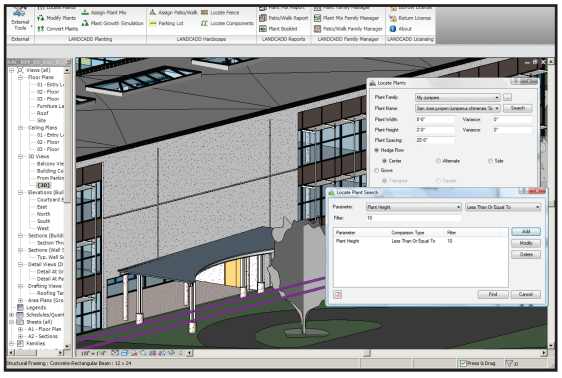

- Eliminate the need to transfer drawing components back and forth between Revit and AutoCAD since the landscape design is part of the Revit model.

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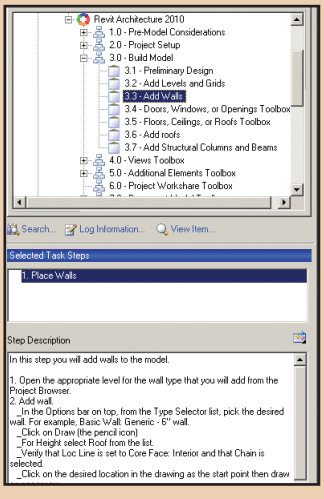

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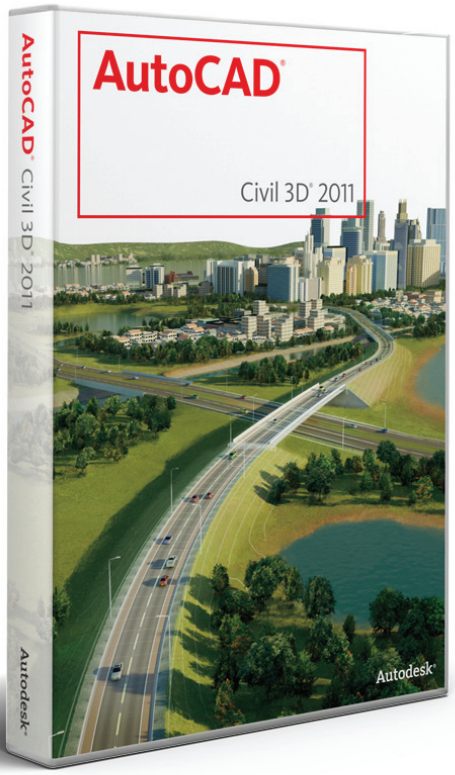
Civil 3D Turns 6: A First Look at the New Release



AutoCAD® Civil 3D® 2011, just released, sports one big change and bunch of little improvements made to various features of the program. The big news for Civil 3D 2011 has to be the availability of a 64-bit version. While a 64-bit version has been available for AutoCAD and AutoCAD Map, Civil 3D has lagged in this area. With the addition of a 64-bit version, Vault projects and certain databases created in earlier versions of Civil 3D must be migrated for use in Civil 3D 2011. This is done to move database types that are no longer supported for a 64-bit environment. Additionally you can only install a 32-bit version on a 32-bit operating systems and a 64-bit version on a 64-bit operating system. Now let's cover some of the little additions to the program.

Alignment enhancements

Offset alignments were added to the product in Civil 3D 2010, which made it easier to widen roads around alignment curves, but the widening criteria needed to be typed in manually. In Civil 3D 2011 you can add automatic widening around curves based on a design standard or typing in values. You can apply the widening criteria at time of offset alignment creation or after using the Add Automatic Widening dialog box.

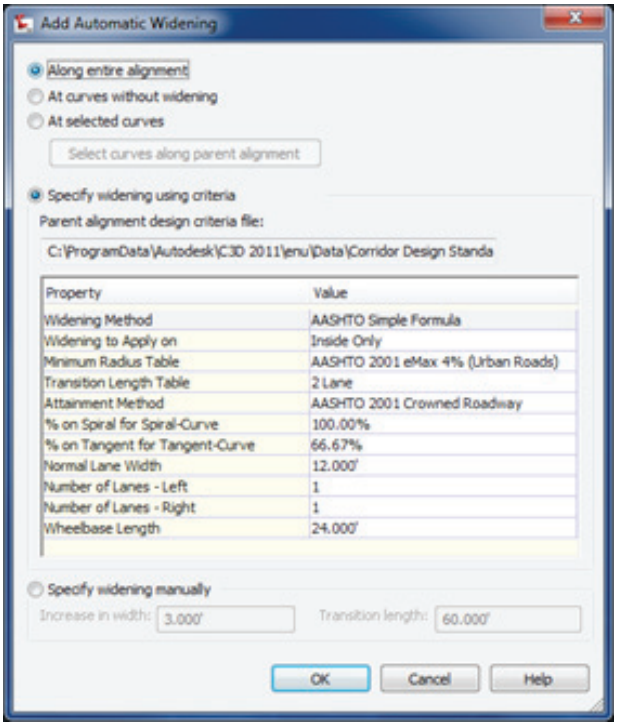


Figure 1: Alignment Widening

In addition, you can now specify the number of segments and the segment type (lines or arcs) to be used to distribute the widening transition linearly along curves. This new feature provides a more realistic looking curve on offset alignments.

Corridor enhancements

I'm most excited about the user interface (UI) improvements to corridors. You can now edit and modify corridors without going into the Corridor Properties dialog box. Another new feature concerns the modify tools. As you use these tools, the appropriate baseline or region is highlighted. Modifying regions is now easy and joyful, instead of a little frustrating. No more hav-

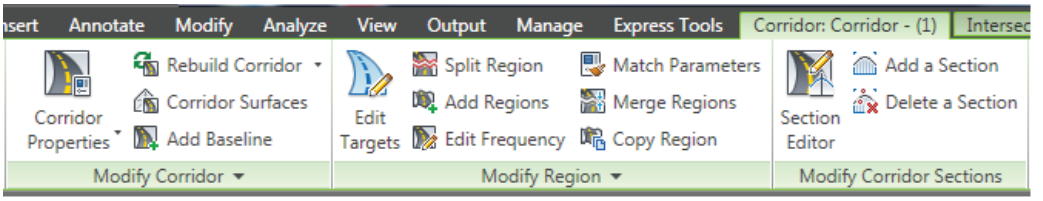


Figure 2: Corridor Ribbon

ing to guess the region—its highlight is right there on the screen as you move the mouse around. Editing Targets outside the Corridor Properties dialog box makes it easy to realize which region of the corridor you are selecting. Select the region on the screen and the Target Mapping dialog box appears for that region. If you want to apply those same targets to another region, utilize the Match Parameters tool to copy the targets to another region.

Another UI improvement is the listing of baselines included in the corridor in Prospector. This makes it quick and easy to see what makes up the corridor without having to select it. This release also includes an option to rebuild all corridors in the drawing.

Data shortcut enhancements

Two commands that were previously undocumented have fully joined the program in Civil 3D 2011. You can now use the Associate Project to Drawing and Associate Project to Multiple Drawings commands from Prospector. These commands associate a drawing or multiple drawings to the selected project. This way, when you open a drawing the correct project will show in the Data Shortcuts branch in Prospector. The Associate Project to Multiple Drawings command may also be used to remove project associations from multiple drawings.

Label enhancements

The big label enhancement in this release is the ability to use a comma (or decimal character) for thousands separator. The use of expressions to create this look will no longer be required. While this will decrease the traffic to my web properties, I'm happy to see this improvement in the program. I am sure surveyors will be, too!

Another new feature is the ability to use a station equation identifier in an alignment label and table property. This will show the station equation with which a specific station value is associated. Also new are geodetic line labels, which will show general segment grid and geodetic distances and directions for applicable label types.

Pipe network enhancements

Once again, pipe networks did not receive any major upgrades in this release. This area of Civil 3D probably needs the most work, in my opinion. Hopefully in future releases we'll see improvements in the user interface for Part Builder and the capability to model pressure pipes.

Still, the additions to the program in pipe networks are sure to make many users happy. For instance the ability to split and merge pipe networks has been a long-requested user feature and has been added to this release. Merging pipe networks is easy and much less painful the modifying XML files, which had to be done in the past.

Another welcome feature for pipe networks is the ability to specify what elevation is represented by a polyline elevation when using the Pipe Network from Polyline command. Previously, the centerline of the pipe was utilized; now options are available for outside top or bottom, the invert, crown, or center elevation. No longer will we have the requirement to use the command and then move the created pipe network up or down the appropriate distance.

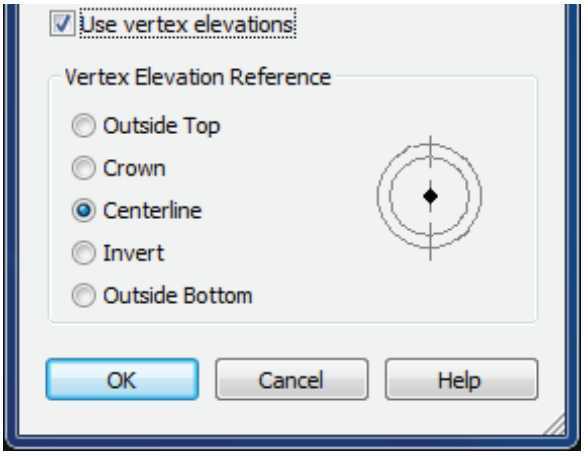


Figure 3: Pipe Vertex Elevation

If you utilize the quantity takeoffs to calculate pipe and structure quantities, you'll be happy to see the addition of extracting part depth information for pipes and structures. The pipe depth is calculated by using the formula (maximum cover + minimum cover) /2 + part outer diameter. For structures, the depth is calculated as the structure's height.

Point enhancements

If you are a big point user and former Land Desktop user, you'll like the addition of list used points. This way you can figure out what point numbers available. After running the command you get a list of number ranges that are available. A new feature in the point group display order is the ability to move a point group from/to the bottom or top of the list. This should come in handy if you utilize point groups to organize and label points in a drawing. This feature allows for the selection of multiple point groups using the Windows selection methods.

Figure 3: Label Commas

Point cloud enhancements

Subscription Advantage Pack in Civil 3D 2010 introduced point clouds. While they were nice to look at they didn't add much in terms of using the information within Civil 3D. Civil 3D 2011 provides a use for the point clouds by adding the ability to extract points from a point cloud to add to new or existing surfaces.

Report enhancements

Have you ever wanted to print reports directly to PDF? Well, in Civil 3D 2011 you can now save most reports directly to a PDF document. For the LandXML reports you can now edit the LandXML settings from the toolbox to make the process easier.

For those who utilize the milling/overlay subassemblies you now have the ability to export the information. The report includes station offset data of the milling areas as well as the total area of milling for the corridor and baseline.

Sections enhancements

Sections have been enhanced with improved volumetric methods. In addition, average end area volumes may be calculated by prismoidal and composite methods. A gap may also be added to the Sample Line Group Properties. In addition, a new gap definition capability has been added to the Sample Line Group Properties on the Material List tab. You can now define gaps in materials based on station ranges. The gap definitions allow for Run In and Run Out distances. The Run In and Run Out distances allow gaps to be excluded between the designated station range, if a zero value is used, or transition from the distances specified to the start and end stations.

If you didn't like utilizing Map Books to create layouts for Section Views, then you will enjoy the new feature of creating layouts from section views. The layouts are added automatically to sheet set for easy printing. Like many of the Civil 3D commands, this one requires some setup for it to work properly.

If you had the need to project objects to section views in Civil 3D 2010, then you became quickly frustrated in having to run the command for each section view. Thankfully the new version has the capability to project linear objects and blocks to multiple cross sections in a single operation. This should be a real timesaver over the previous version.

Superelevation enhancements

I'm calling the superelevation enhancements a little improvement, but you can tell the product's developers spent a ton of time rewriting the user interface for superelevation. A new calculate/edit superelevation command replaces the tab on the alignment properties. A wizard helps streamline the process of adding superelevation to an alignment. The wizard provides a step-by-step method of how the superelevation should be applied along the alignment or at specific curves. If the curves overlap, new options are available on how they should be resolved.

A new curve manager palette provides an easy way to step through each curve showing the criteria information that was used to calculate the superelevation. Temporary graphics are also shown in the drawing, providing further feedback. A superelevation tabular editor provides a place to edit the superelevation data applied to the various curves.

Also new are superelevation views. Superelevation views provide a way to graphically edit superelevation data. Revisions made in either the superelevation editor or the superelevation view are dynamic between them—any changes made in one reflect in the other. Handy grips are provided to adjust the points of interest. Additional options are provided on in the superelevation band styles to control the band height and specify a vertical exaggeration.

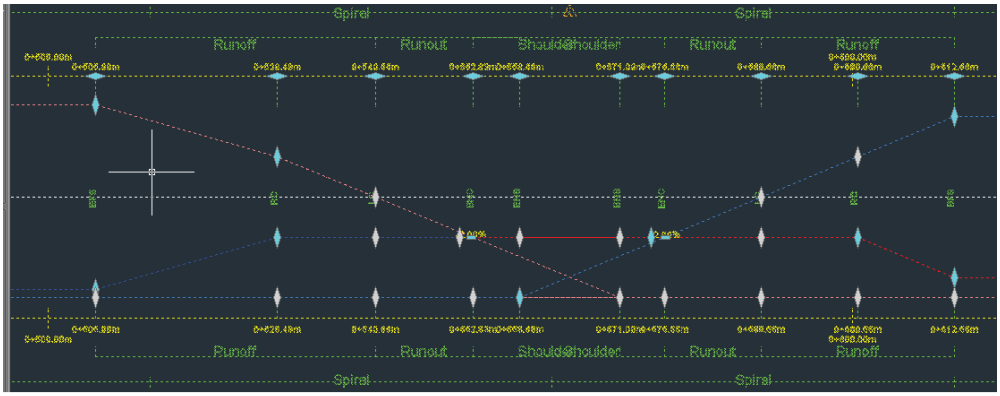


Figure 4: Superelevation

Surface enhancements

Surface enhancements include an enhancement to how bounded volumes are calculated. There is now an option to specify a datum elevation. Previous versions only based bounded volumes on a datum elevation of 0. This new option can be used to calculate the amount of cut or fill from a specific elevation, which will assist users who need to calculate the amount of cut or fill compared to a specific elevation.

Miscellaneous enhancements

Improvement for intersections include the ability to use spirals in curb return fillets and to utilize DGN files as underlays. Notable is the ability to use the standard AutoCAD NCOPY command on the DGN underlay. The NCOPY command copies items located in an XREF, or now DGN, to the current drawing. Features included in the Civil 3D 2010 Subscription Advantage Pack have been incorporated into the program.

Other than database migration required to upgrade existing survey databases, changes for Survey consist primarily of modifications to the right-click commands in the Survey Toolspace. The order and functionality for some of the right-click commands have been modified.

Wrap up

Overall, the Civil 3D 2011 product improvements appear to skew toward highway design projects. Those working on commercial and residential development projects may have to wait for improved economic conditions to see major enhancements to feature that pertain to their work. Hopefully, the next release will incorporate users' wishes for those projects.

Christopher Fugitt is a Civil Engineer and has spent the last eight years designing government projects as well as residential subdivisions. Before working as a Civil Engineer, Christopher worked for a General Engineering Contractor on subdivision and mining projects. Christopher earned his B.S. degree in Civil Engineering from California Polytechnic State University, San Luis Obispo. Christopher maintains and authors the Civil 3D Reminders blog at http://blog.civil3dreminders.com/

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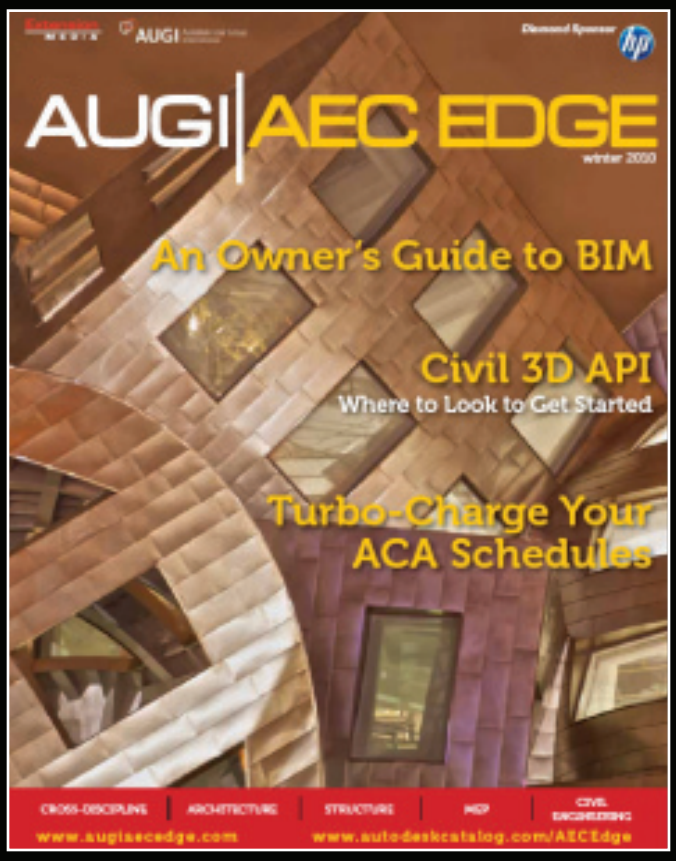

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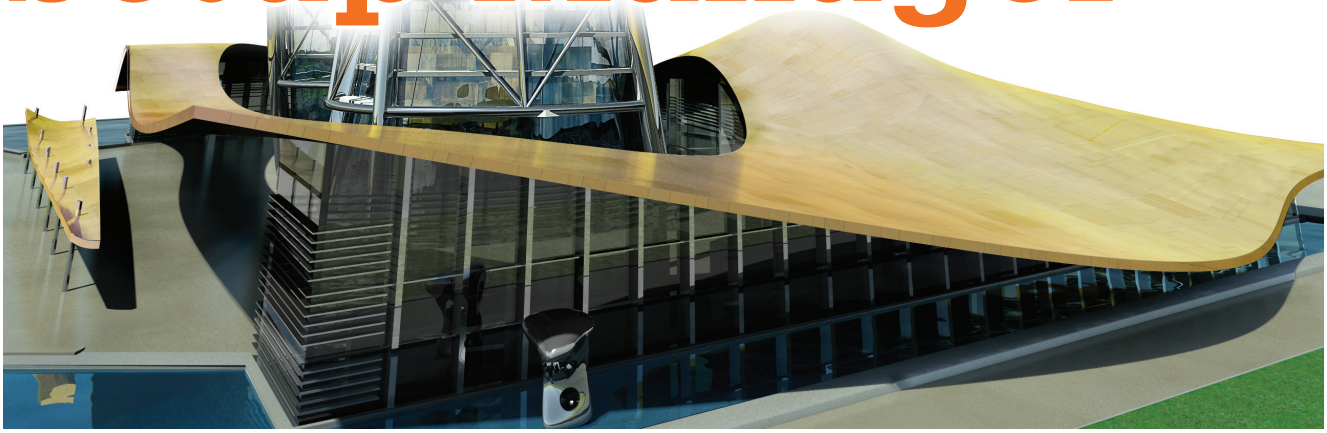
Timesavers! Layer States Manager & Page Setup Manager



With spring officially arrived, clients are knocking on our door and congregating in the lobby—awaiting their plans to begin construction.

Okay, it's not that bad, but people are anxious to begin bidding on jobs, just as developers are eager to see their buildings and/or streets up and running. That means we have little time to complete those plans both accurately and on time.

Putting out fires seems to be a never-ending aspect of a drafter's job. As a consequence, we sometimes forget to manage our time, or at least learn quicker ways of accomplishing certain (and often mundane) tasks. Increasing our productivity is often found in the little things we do.

Layer States Manager

Layer management is one of these "little things." I looked through our standard template the other day and found we use—to start—84 layers. Add to that any layers third-party software creates and the average drawing can easily contain 100-150 layers. Weeding through them all, especially for someone not entirely familiar with the naming structure, can take a lot of time—time better spent drafting.

To help clean things up, enter Layer States Manager. It allows you to save and restore what layers are turned on, off, frozen, locked, and so on. You'll need to plan ahead, but not a lot. Making changes to those states and adding more takes but a few mouse clicks. It certainly takes up less time than going through and turning layers on and off individually 10 times a day.

There are several ways to access Layer States Manager. You can go through Layer Properties and click on the *insert icon. jpg* icon. If you use the Ribbon, it's within the Layers panel. If you're a fan of typing commands, it's LAYERSTATE.

Before using the manager, you should set the layers how you want. That way you'll know you have everything set up appropriately.

Once done, go to the manager. The dialog box is straightforward (see Figure 1). Here you can create a new layer state,

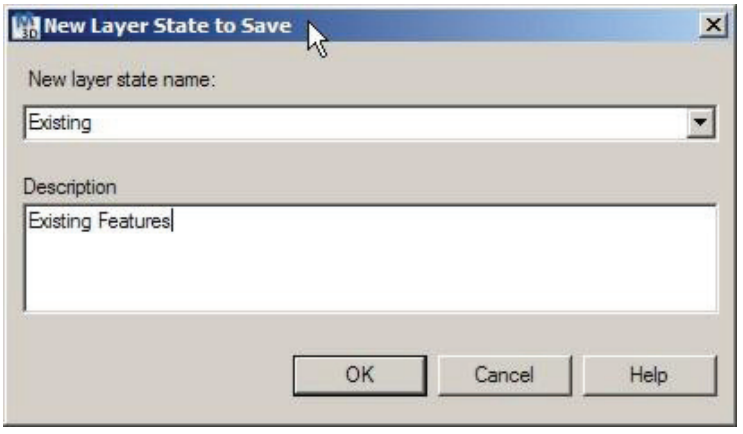


Figure 1

save, edit, rename, and delete. You can also specify to include or ignore Xref layers within the state. I recommend that in the description you be as detailed as possible. The more layer states you create, the more confusion it may cause, especially if some layer states have only a few differences.

If you use a particular layer state often, you can export it and import it into other drawings. That way, you're not spending a lot of time creating layer states every time you open up a different drawing. You can also create layer states in your template drawings as well.

If you click on the little arrow in the lower right of the dialog box, you can tell AutoCAD® which states to include and/or ignore when you're restoring (see Figure 2). For example, in some cases you may want certain layers locked at all times regardless of the layer state you use. Click off the Locked / Unlocked option and keep going.

What if after you create your states, you notice a layer missing or turned on when it should be off, or more layers are added in the meantime? No problem. Simply click on the Edit button. A new box, which looks similar to the layer manager, will pop up (see Figure 3). You can make your changes and hit OK. Another way is to again set up the layers the way you wanted, open up the manager, and resave the state you want updated. The program will ask you first if you want to overwrite.

So far I've talked about turning layers on/off, freeze/thaw. As you can see from Figure 3, you can modify the color, linetype, and thickness as well. In what situations would those be useful? For me, sometimes my boss likes to see certain entities in color, to stand out with a thicker line or even a different linetype. Yet the changes would not work once the final plans are printed. I can easily create a layer state with those particular changes, which I can then revert back to when the final plans are complete.

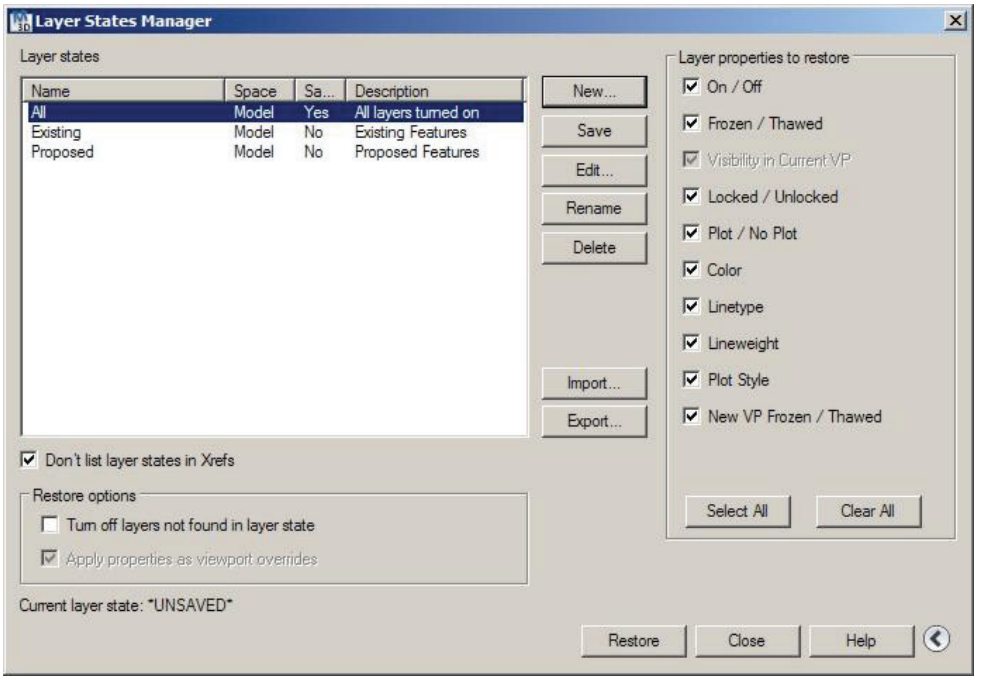


Figure 2

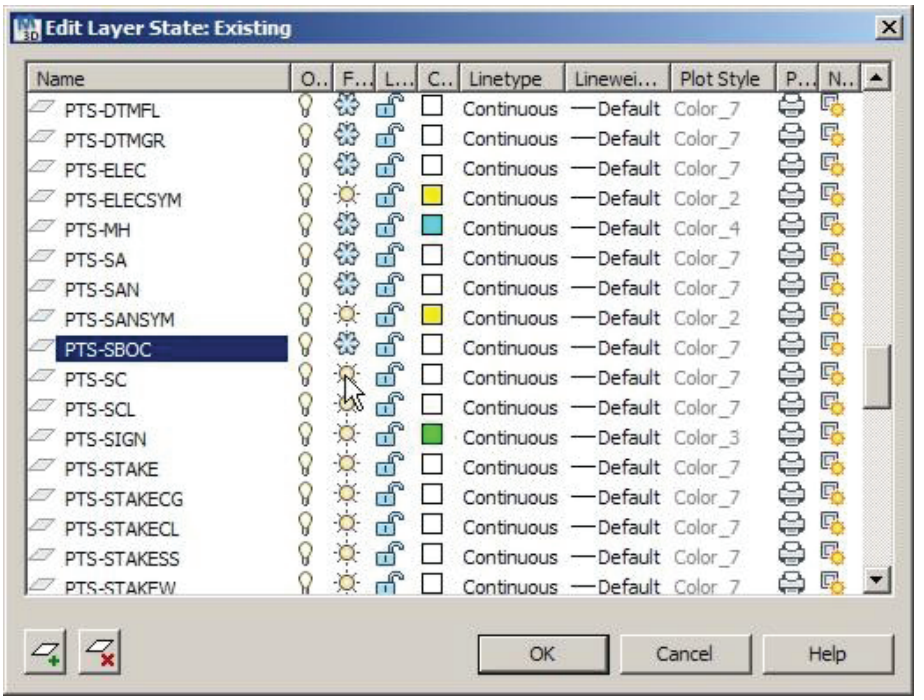


Figure 3

There are other times in a set of plans when the proposed features need to stand out, and in other drawings the existing features need to stand out. Again, creating a layer state is simple enough.

You could create a pen definition file to accomplish the same thing. However, I'm partial to WYSIWIG (What You See Is What You Get). When I see a yellow line, I expect it to print out a certain way, either in color, grayscale, or black-and-white. If I change the pen definitions in my plot, I'm not always aware I made those temporary changes until after I print. It's a waste of time and paper. Plus I don't always use the print preview when I'm printing a large set of plans.

If I notice my yellow lines are suddenly blue or have a heavy thickness prior to printing, then I know I need to update the proper layer state.

Multiple layer states work well when different layouts in the same drawing call for different colors, linetypes, and/or weights. In case you didn't know, along with being able to freeze/thaw specific layers within a viewport you can also modify the color, linetype, and weight.

For a project I'm currently working on, there are two phases. For the first phase, I need the second phase portions to be grayed out. The same goes for the second phase sheet, only reversed. I created a Phase I layer state and a

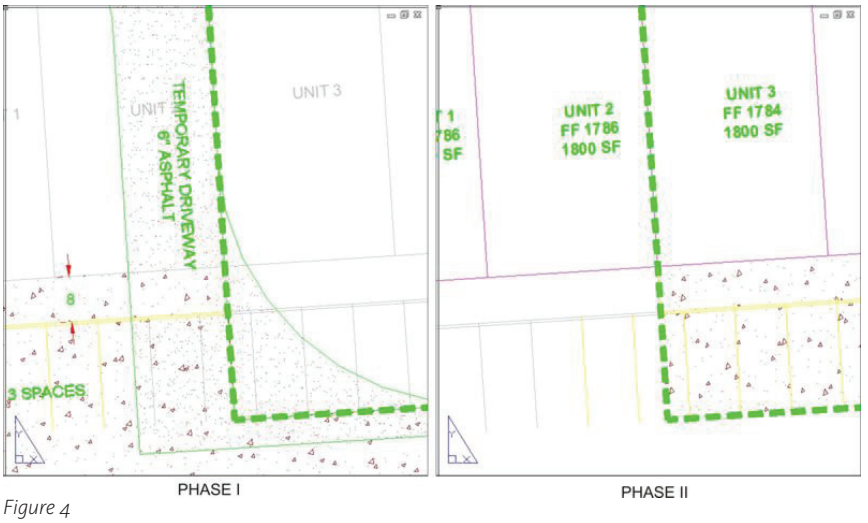


Figure 4

Phase II layer state with the appropriate layers grayed out (see Figure 4).

In a complicated drawing, you could easily end up with multiple layer states, but it's easier to weed through a dozen layer states than hundreds of layers. Plus, with regard to printing, you'll know you're printing the right layers at the right color, linetype, etc. once you send it to the printer. Using layer states will save you time and the frustration that comes from weeding through multiple layers. You can also be certain that the final plans will look exactly how you and your clients expect.

Page Setup Manager

Along with standard layer conventions and standard title blocks, we also use standard print layouts. At my firm, we print, for the most part, 24x36 and 11x17. Each size uses a different printer and pen definitions file.

When creating a multiple-paged set of plans, setting up the layout sheets can be tedious at best. A quick way to save time setting up the layouts is to open up your standard template file (if you don't have one, create one!). Go to the Page Setup dialog box—either right-clicking on a Layout tab, through the Application Menu > Print > Page Setup, or by typing in PAGESETUP. Note: If you're in model space, it'll set up a print layout within model space only. The same goes for paper space, so make sure when setting up your standard print setups that you are in the proper space.

This action opens up the Page Setup Manager (see Figure 5). Click on New and it will bring up a new box asking for the name of the setup (see Figure 6). I'd make it as detailed as possible, so there's no confusion if some layouts are similar to others. Once you give it a name and hit OK, it will bring up your standard Page Setup dialog box. Make whatever changes you need, then click OK. Save all the changes in your template file and the next time you create a new drawing with that template, all the page setups will be available. To set it current to that layout simply open up the manager, highlight the one you want, and click on Set Current.

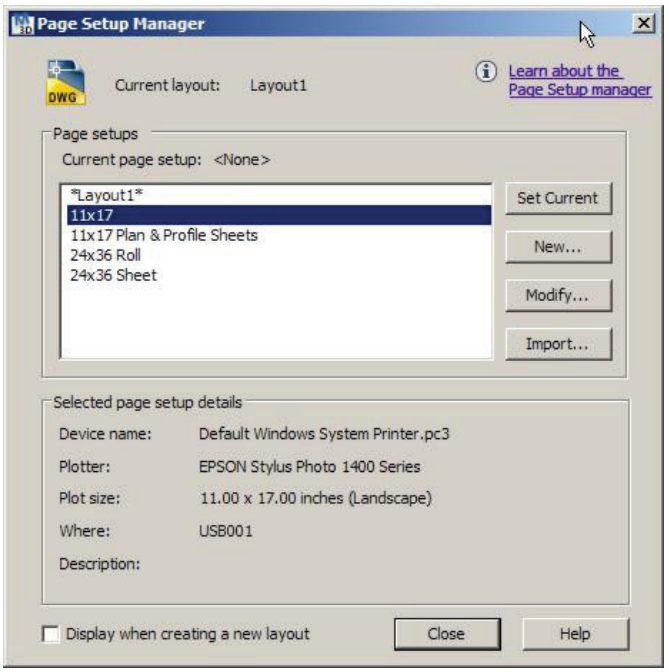


Figure 5

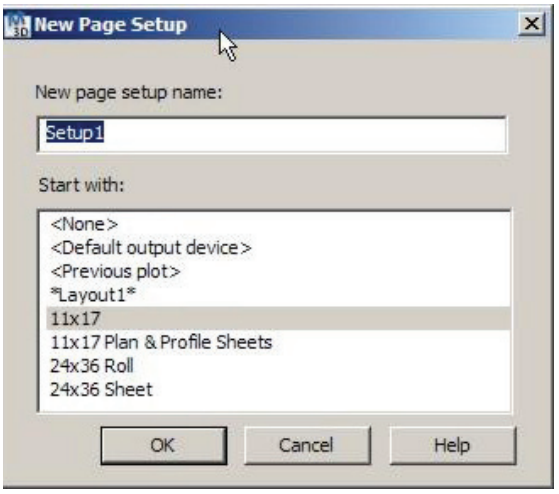


Figure 6

Let's say you want to bring in a saved layout from another drawing. All you need to do is click on Import. This brings up a file manager, which you can use to navigate to the drawing you want. Click on that drawing, and it will bring up a new dialog box showing all the saved page layouts in that drawing.

An even quicker way is through Design Center. From there, all you need to do is grab the layout you want and drop it into your current drawing. How slick is that? The only caveat is that the layout has to be used within the drawing and not merely saved in the manager.

When it comes to drafting, time is money. The more time we save by using templates, creating layer states, and saving standard print layouts, the more money we save our clients (and keep their deadlines). The happier we make our clients, the more likely they will continue to use our services and perhaps even recommend us to others. And in any economic circumstance, that's what we're after.

Andra Marquardt works for Toman Engineering Company, a civil engineering firm. She is a Registered Land Surveyor in the state of North Dakota and holds AAS degrees in Civil Engineering Technology and Drafting and Design Technology. She has been using AutoCAD since 1991 beginning with Version 9.

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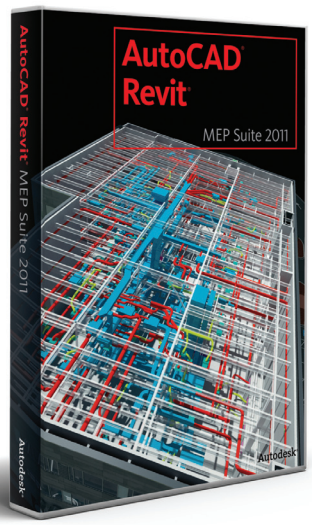
Twists, Tweaks and Turns

What to Expect in Revit 2011



Editor's note:

In this column we take a look at changes and new capabilities in Revit Architecture, Revit Structure, and Revit MEP for 2011. This article is based on beta versions available at the time of writing, so there might possibly be differences in released products.

–Chris Fox, AUGI Revit Editor

This is the time of year when RevHeads the world over begin to anticipate the next release. What has changed about the interface—is there any new look as comprehensive as the Ribbon? How about new features—can we model domed floors yet?

Come along on this year's Magical Mystery Tour while we examine the latest offerings from the Factory! There is quite a long list—will your personal request be on it? Those of you who have worked in AutoCAD® or AutoCAD-based applications will find more than a couple changes that bring AutoCAD functionality into Autodesk® Revit®.

Tidy up your ribbons

The user interface for the Revit 2011 platform has changes to the appearance and operation of ribbon items. Tool icons are all equal sized (and enhanced in many cases); in Revit Architecture and Revit Structure, opening tools are on the Home tab.

- The Modify tab holds a number of differences in 2011.
- Modify tools do not now have text labels.
- The Modify tab combines with both placement and editing context tabs to keep tools visible. Non-available tools are gray.
- Specific context placement or editing tools appear docked to the right of a spacer on the Modify/Place tab; the first eight panels from left to right are always the same. Context tool panels are a different color.
- When placing sketched items, Finish and Cancel appear on a Mode panel at the left side of the context tools.
- Figure 2 shows Modify/Place/Create Floor Boundary tabs from Revit Architecture. Cancel/Finish icons are highlighted in their new location.

The Options dialog user interface tab holds controls for tab display behavior. You can have the project or family editor ribbons return to the previous tab when you clear a selection or exit a tool, or stay on the Modify tab. You can also display or hide the context tab when an item is selected.

Speaking of modify tools, there's a nod to AutoCAD in Revit 2011: Move, Copy, Rotate, Mirror and Delete now behave as Verb-Noun (Action-Object in Autodesk language) tools. With nothing selected in the view, you can now start these tools, select objects, press Enter/Spacebar, and perform the action! How retro is that? What's next… platform shoes? Fins on cars? Seriously, Revit's pick-first-then-do mode has been an irksome adjustment for many peo-

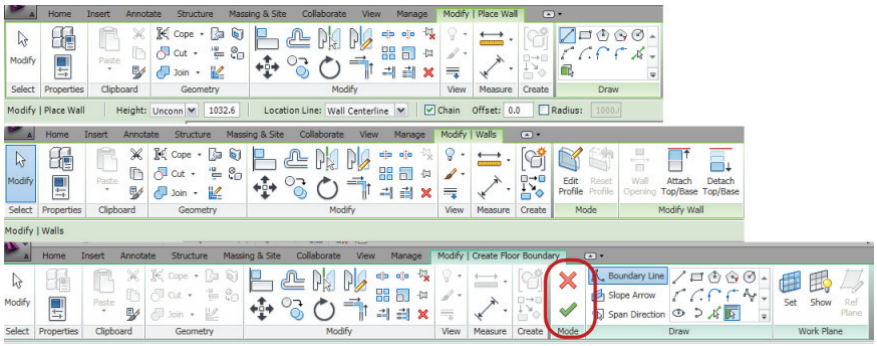


Figure 2: The Modify tab shows up in combination with placement or editing tools.

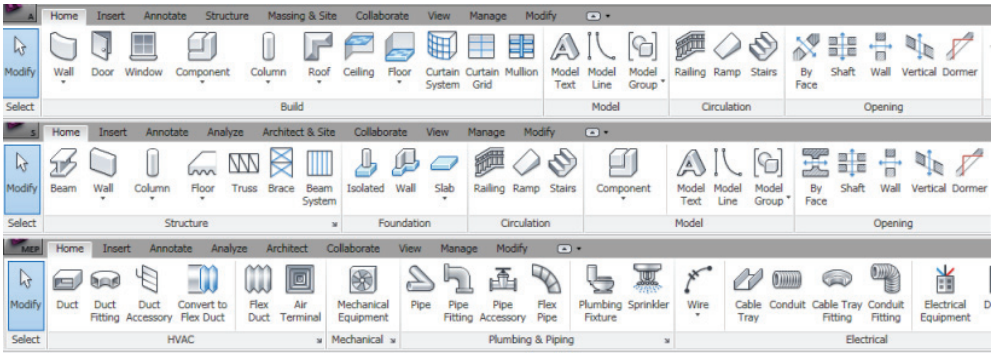


Figure 1: There's no place like Home—new look icons and layout for the Home tab in Revit.

ple used to AutoCAD workflow. Let's hope this small change speeds you up.

Need access and status?

The Quick Access toolbar has been expanded in 2011, with more tools placed on it by default, such as Measure, Aligned Dimension, Tag by Category, Section, Thin Lines, Switch Windows, and Close Hidden Windows. There is a dialog for customizing the QA toolbar, so you can reorder your tools and add spacers. The QA Toolbar can now hold the Type Selector.

The Status Bar now hosts Worksets and Design Options tools so they are always exposed. These tools also appear on the Collaborate and Manage tabs, as before.

tivates. You can TAB from field to field to make multiple edits, then click Apply, press ENTER or move the cursor off the dialog to read in your entries.

Editors and right-click options

Other UI changes affect Group Editing, and In-Place modeling. In Group Edit mode, the Edit Group context panel docks in the upper left of the drawing window, and Properties shows the group being edited. When creating or editing an In-Place component, the In-Place Editor ribbon completely replaces the project ribbon until you Finish or Cancel. Note the position of Finish Model/Cancel Model in Figure 5.

Figure 3: MEP 2011 QA Toolbar with the Type Selector added and Status Bar showing Worksets and Design Options.

Get into property

Revit 2011 now exposes Instance Properties as a palette, docked above the Project Browser. With nothing selected it reverts to View Properties. With a placement tool active, you can cycle the Properties display between the view properties and properties of the new object you are placing. The Options Bar shows placement options as in 2010. This same cycling is available when an object is selected.

You can open Type Properties with an

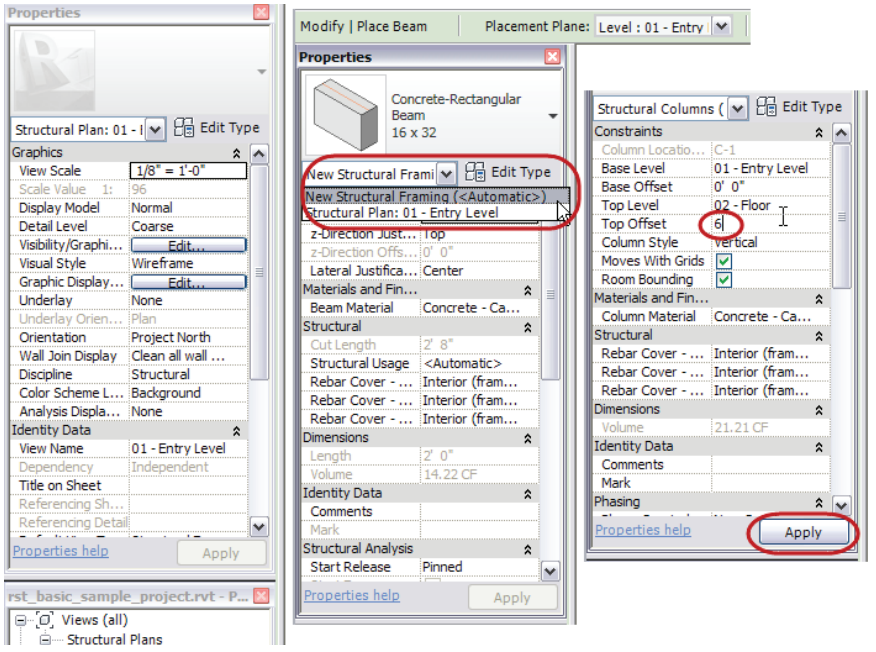


Figure 4: Three views of Revit Structure 2011 Properties. Left to right: nothing selected (View), placing a column (View/Object), editing a column offset (Apply).

Edit Type icon in the Properties palette. With an item selected, if you make changes in property fields, an Apply button ac-

Right-click menus now show Repeat [Last Command] and a Repeat Commands list. For another trip down memory lane,

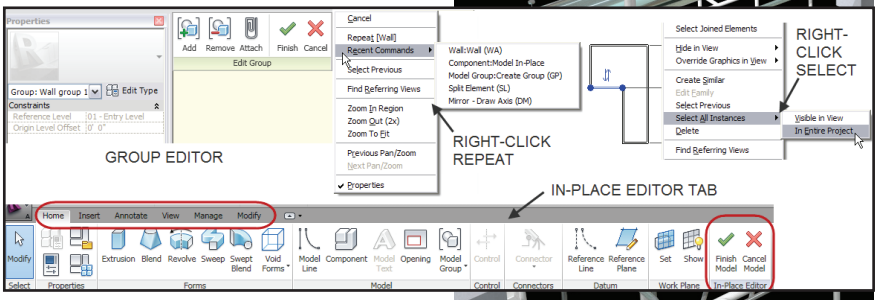


Figure 5: Group Editor, right-click repeat and Select All options, and the In-Place Editor ribbon.

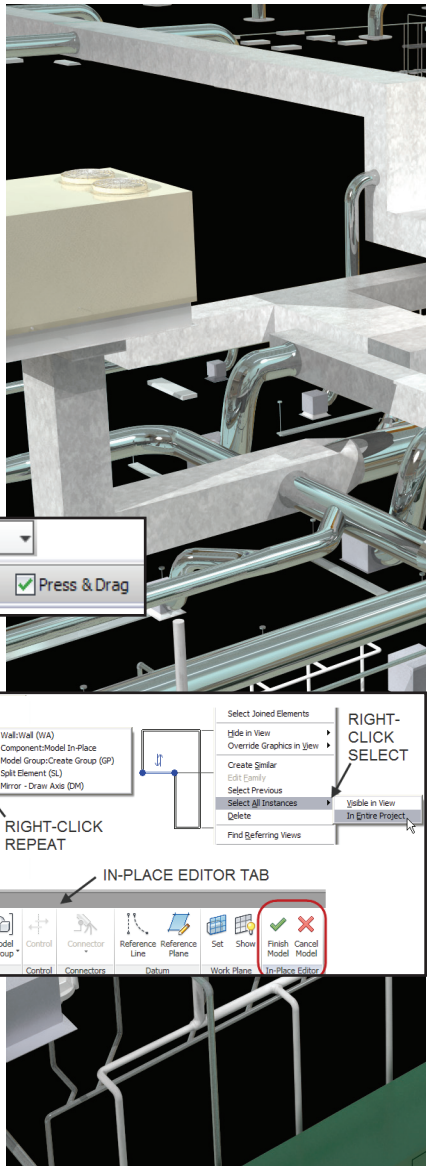


Image courtesy of Design West Engineering

pressing ENTER (but not SPACEBAR) with no tool active repeats the last command, even after Modify. How AutoCAD is that?

Select All Instances from the right-click menu now has options to select Visible in View or In Entire Project—very handy.

Workset visibility

Moving away from changes to the interface, there are a number of added capabilities and functional differences in other aspects of the Revit platform.

Worksets have a new visibility control setting in Revit 2011, and it reaches into links. In the Worksets dialog, there is a column for Visible in all views. In the VG dialog for files with Worksets, you can now cycle between Show, Hide, and Use Global Setting. When a workset file is linked into a host, there is now a Manage Worksets button in the Manage Links dialog, which allows the user to open or close worksets in the link.

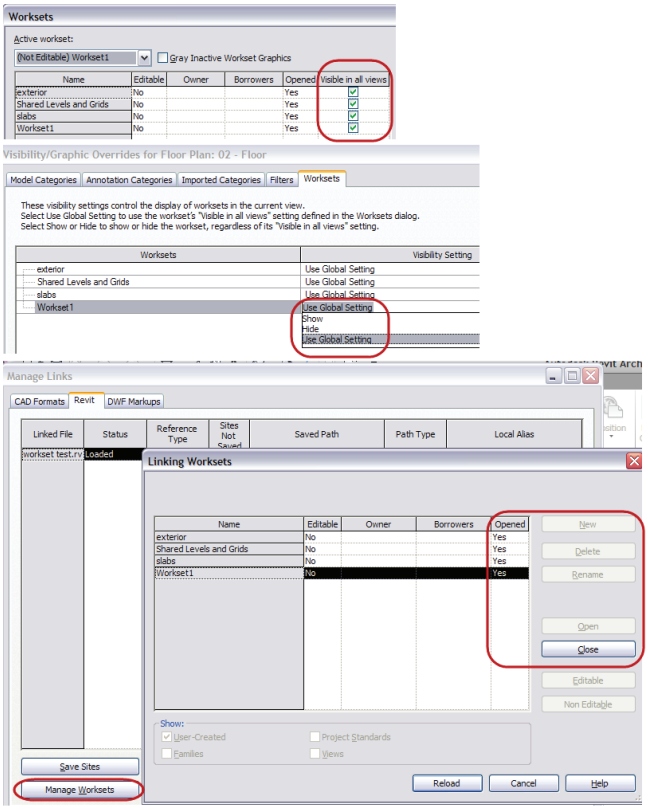


Figure 6: Workset visibility controls appear in the Worksets dialog, Visibility/ Graphics Overrides dialog, and Manage Links dialog.

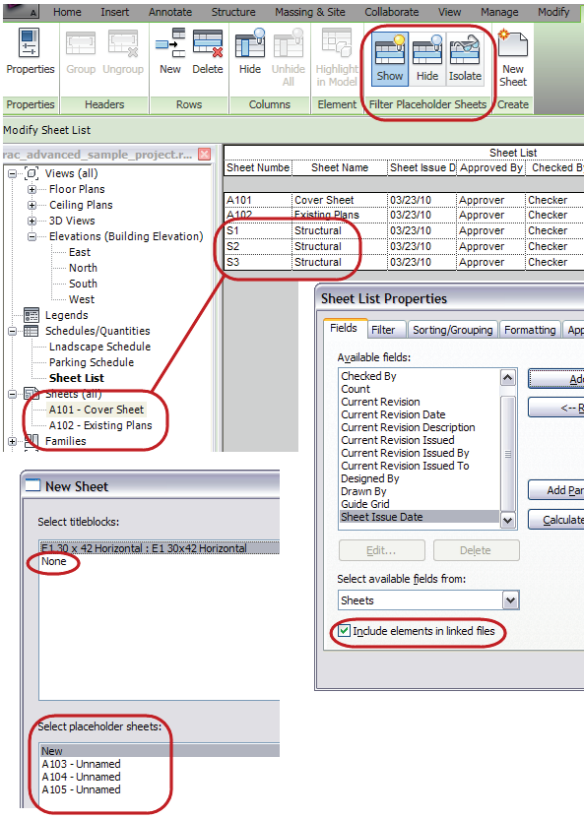


Figure 8: New controls for making and listing sheets.

Dims, text, and sheets

The documentation side of Revit sees some changes in 2011. Temporary dimensions are smarter and easier to control, text gets more graphic, and sheet schedules are more complete.

Temporary dimensions, which snap to wall centerlines by default, now remember witness line adjustments throughout a Revit session. There is a new control for temporary dimension appearance in the Options dialog.

You can show or hide the border (bounding box) of text objects, and control the border offset around the text, as a type property. Text leaders now have more attachment points at the left and right sides of the text box. YES! AutoCAD lives!

Sheet Lists, which are schedules of the sheets in your project, can now hold rows that are not assigned to active sheets. These are called placeholder sheets, and do not appear in the Project Browser. They can represent consultant sheets that will be added to the printed set, or you can convert them to project sheets. You can include links when creating sheet lists. You can now create a sheet with None as the titleblock selection.

Family editor

The Family Editor holds a number of changes and improvements. In the Family Types dialog, the Identity Data group is now scrolled up by default, so you no longer look at that long list of parameters unless you wish to. When creating new parameters, they auto-classify into groups, and the default parameter type is now Length.

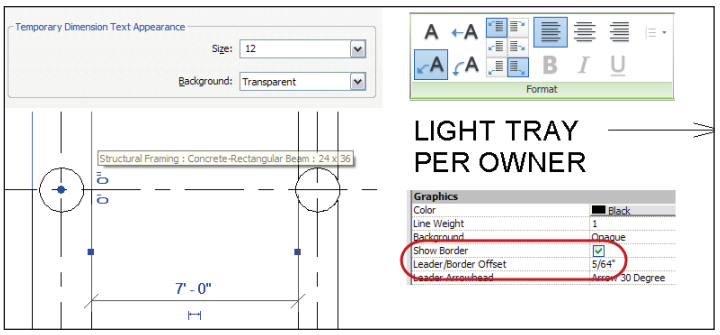


Figure 7: Temporary dimension controls and witness line placement on the left; text leader and border options on the right.

When you associate parameters by formulas, selecting either in the drawing window activates a Related Dimensions button that highlights the related dimension

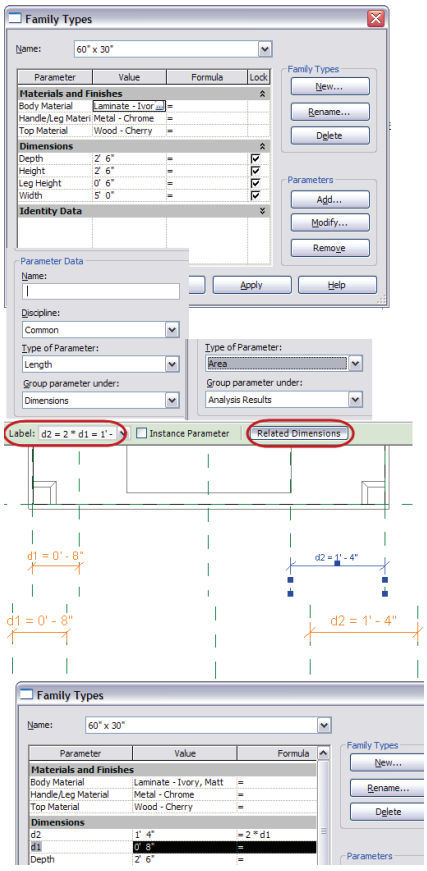


Figure 9: Better classification for parameters in the Family Editor and highlights for dimensions in formulas.

in orange. Selecting either of two related dimensions in the Family Types dialog highlights both dimensions in the drawing window, as shown in Figure 9.

The Label function drop-down list now holds formulas, and you can label a dimension as a right-click option. This behavior is also in the Concept Design family environment.

You can lock labeled dimensions. The padlock icon will display in this case.

There is a new shared parameter called a reporting parameter, which does not drive geometry, but is driven by a dimension. This then exposes that dimension for use downstream, as in schedules or analysis. These are useful where changes in the reported dimensions are made according to placement, as with walls or curtain panels.

Links, floors, and 3D alignment

We'll finish up the platform enhancements with a grab bag of items.

- Links now recognize View Filters and you can set the filters in the VG dialog for control By Host View, By Linked View, or Custom.
- Tags now reach into links, except for room, areas, zones, spaces, keynotes, beam systems, and span symbols.
- The Align tool no longer requires the user to select a work plane when in a 3D view. You can select a node, vertex, edge, surface, level, or reference plane as a target, then select the element to align. In the Concept Design environment, you can align reference points and lines along with object faces.

API, oh my

The API for Revit 2011 has undergone significant renovations and enhancements, too many to list in this article—46 pages worth in the Feature Summary! Here are some of the changes that API programmers will need to become familiar with.

- Namespaces have changed.
- The API has been split into two DLLs.
- There are new classes for XYZ, UI and ElementID.
- ElementType replaces the Symbol class, with new interfaces associated.
- There are new interfaces for Transactions.
- Events no longer open transactions automatically.
- There is a new mechanism to register API applications.
- You can now localize external command buttons.
- Regeneration behavior has changed.
- New element iteration interfaces are in place.
- VSTA has changed significantly.
- New Dynamic Model Update.
- New failure handling.
- New selection and pick options.
- New options for ribbon customizing.
- Revit-style task dialogs.
- Sun and shadows settings.
- Demand factor and load classifications for MEP.
- Panel schedules for MEP.
- Cable tray and conduit for MEP.
- New Analysis Visualization Framework for external analysis applications to create temporary display in Revit.

Okay, that covers the platform enhancements in Revit 2011. Now let's take a look at application specific changes.

In Revit Architecture and Revit Structure, floors with metal decking now have a Span Direction control in the Create Floor Boundary context tab. You can pick or sketch lines to indicate the span direction. Beams Systems in Revit Structure have a similar control in the Create Beam System context tab.

Revit Architecture—concept models

The biggest documented changes in Revit Architecture 2011 occur in the Concept Design family environment.

Using the Cut Geometry tool, solids now cut solids when they intersect. The resulting form is not a combined form, but separate geometry.

Forms can be dissolved back into their originating profile curves. Surfaces are lost, but the curves and path (if used) remain and can be edited to create a new form. Dissolved form construction geometries (such as reference points) also remain.

Divided surfaces can now be controlled by intersecting levels, reference planes and lines on reference planes, or a combination of U grids, V grids, or Intersects. Divided surfaces do not host cropped or overhanging border panels, but these are in development.

For components that need to change flexibly to fit unique conditions, the pattern-based curtain panel introduced in 2010 is now joined by the Adaptive Component, created by snapping to adaptive points made from reference points. Adaptive points are not available in massing families, but families with adaptive points can be placed into massing. There is a new template for adaptive points: Generic Model points based.rft.

Revit Structure—slanted columns

In Revit Structure 2011, slanted columns have been enhanced.

- You can now place slanted columns in plan views.
- You can adjust the working point of slanted columns attached to beams.
- You can define the end display of a slanted column attached to a floor or slab.
- You can cut an unattached slanted column end horizontally, vertically or perpendicularly.
- You can define how a beam vertically compensates when a slanted column is resized.

Beam systems and trusses

Beam Systems are easier to create, edit, and remove in Revit Structure 2011. When sketching or editing a system boundary you can set the Beam Direction by drawing a line, picking a line, or picking a support. The direction references do not have to be inside the beam system sketch. You can justify the beam system to your direction line. You can now remove beam system definitions and leave the beams in place. Combined with one-click placement, this provides speed and workflow flexibility when creating framing.

Trusses have been improved in Revit Structure 2011. You can now attach bottom chords of trusses to floors and slabs.

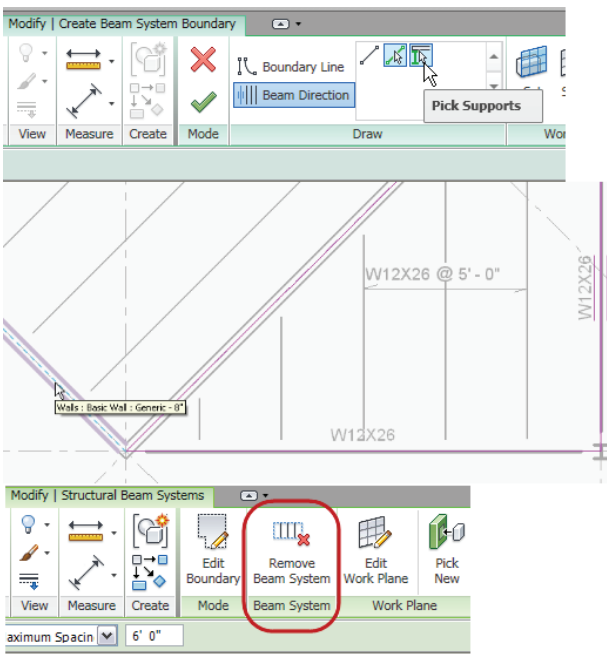


Figure 10: Beam system direction and beam system remove.

You can sketch chords on trusses that have been attached. As with Beam Systems, you can remove the Truss family while keeping the chords and webs in place.

Connection symbols and reinforcement

Several new connection symbol families have been added to the library files. You can load, select, and specify connection symbols for beams, braces, and column tops and bottoms through the Structural Settings dialog.

Structural reinforcement has several enhancements in Revit Structure 2011.

- Reinforcement volume and length units can now be rounded and displayed appropriately.
- Slab edges now have cover properties and can host reinforcement.
- The first and last bars in a rebar set can be suppressed.
- Cover lines can persist in the view and can be styled.
- An additional rebar bending radius has been implemented for international codes.
- Area reinforcement Major Spacing can now be placed in labels and tags.
- You can now specify and place fully dimensional spiral rebar that can be scaled, rotated, and resized.

Analysis

Analytical projections have been augmented. You can now project horizontally from columns to the default plane, the auto-detected plane, or a named reference plane. You can horizontally project from a beam's center line, location lines, grids, and named reference planes. You can project horizontally from the center of a wall core to accommodate varying widths in vertically compound walls.

Top or bottom vertical projections from columns will now auto-detect beams when floors are not present. You can project vertically from the location line or bottom of a beam.

You can now use the top or bottom of the analytical model of a column as a source for manual analytical model adjustment.

And last for Revit Structure, you can set rigid link analysis parameters for beams. These adjust to attached column and find other columns within the same space as the beam. This provides rigid links along a beam between its connected ends.

MEP

Quite a few developments appear in Revit MEP 2011, continuing the growth of this relatively young product.

- Electrical objects in MEP now include conduit and cable tray, which can be routed as individual runs, with or without fittings. You can schedule runs without fittings to report the overall run length. Cable tray comes in types including channel and ladder. Conduit can connect to cable tray segments, with or without touching. Conduit and cable tray have graphics for coarse, medium, and fine detail level display. Conduit and cable tray have user-modified bend radius values. There is a new surface-based conduit to equipment connector.
- MEP 2011 supports Copy/Monitor from linked architectural models. You can copy and monitor air terminals, lighting fixtures, mechanical equipment, and plumbing fixtures.
- You can place valves, fittings, and other accessories in elevation or section views.
- Tag on Placement is now available for most objects in MEP.
- One-click ceiling placement using walls from a linked architectural model is now possible. The ceiling is not constrained to the walls that were used to place it.
- Flanges now include pipe fittings.
- Oval duct is now available. Fittings for oval duct are in the library.

Panel schedules

Customizable panel schedule templates can be used to create panel schedules based on company standards. For example, you can add and remove columns and rows, combine cells, and insert text or parameters related to panel schedules. You can also customize the appearance of the header, circuit table, load summary, and footer sections. Panel schedule templates are available for branch panels, data panels, and switchboards.

In panel schedule views, you can rearrange circuits on the panel by moving them up, down, left, and right. You can also balance the load across phases, and update panel information. Circuit slots can be locked or grouped together. Blank slots can be marked as spares or spaces.

Panel schedules from previous releases of Revit MEP can be upgraded. For panel schedules not placed on sheets, Revit automatically applies the default template to it (per type). For panel schedules that have been placed on sheets, Revit creates a single custom template based on the first such panel schedule it encounters.

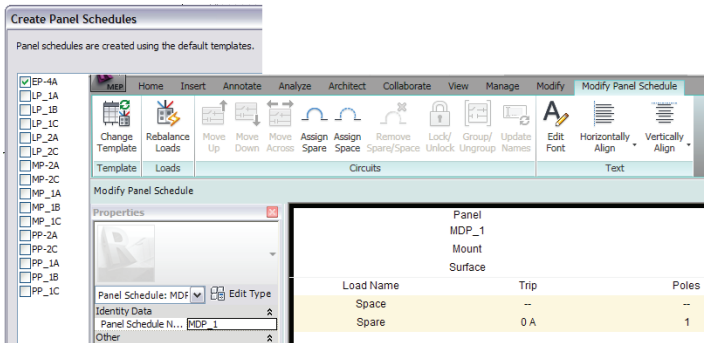


Figure 11: Panel schedule templates and controls.

Demand factors

Demand factors have been updated and now can be customized. Load categories are customizable and can be displayed in panel schedules. If you open an existing project, you'll need to use transfer project standards to bring in the new demand factors and load categories. Then, edit the electrical families used in the project to specify the demand factor to be used.

Electrical content

New types of electrical content have been added in RME 2011 for communications, fire safety, data, nurse call, and so on. Control panels have been added in addition to the individual controls or devices, so many of these objects can be connected to their appropriate panels. The location for some electrical content has changed from previous releases of Revit MEP in order to group them into logical folders. Receptacles are now found in the Terminals folder.

Conclusion

I hope this quick introduction has prepared you for the new release of your Revit design application. There is a lot that is new in Revit 2011, a lot that is different, and a few things that are the same…as good old AutoCAD!

Chris Fox is the Revit editor for AUGIWorld, *and has written numerous articles on Revit Architecture, Revit Structure and Revit MEP. He has written Autodesk Official Training Courseware for Revit Architecture and Revit Structure and* Introducing and Implementing Revit Architecture 2010, *published by Autodesk Press. Chris recently moved from the US to Australia, and is leading training classes in Revit through corporate, university and technical school contacts there. You can reach him at chris.fox@archimagecad.com.*

Bring Order to Chaos with CAD Standards

There are many reasons to create and utilize CAD standards in AutoCAD® Architecture. For starters, they bring uniformity to a world that would otherwise be in chaos. For this reason alone, they should be applied everywhere.

While some CAD managers write their own standards, others use standards that are already available, such as AIA or NIBS. It is important in the ACA world to use CAD standards; otherwise the same floor plan could take on many different forms and be confusing for an end user.

Once you write your CAD standards and publish them via How To manual, web, and so on, how do you implement them into your drawings and ensure that they are being followed? Let's look at how to create and implement CAD standards files in ACA once you have your standards written using the Manage tab of the Ribbon.

Creating a CAD standards file

To begin implementing CAD standards in ACA, you must first create a CAD standards file. To do this, begin by opening a new drawing. Next, you need to establish the desired settings for layers, linetypes, text styles, and dimstyles. You may also have your standard Title Block included in this drawing. Finally, you must save it as a Drawing Standards file by changing the file type to *.dws (see Figure 1). You can do this for each type of drawing you will create—architectural, electrical, mechanical, and so on.

Configuring CAD standards

Now that you've created your CAD standards file, you can associate that file with any drawing. Users should be required to do this prior to beginning any new drawing to maintain consistency throughout all drawings. Under the Manage tab on the ribbon, go to the CAD Standards panel and select Configure (see Figure 2). A dialog box will open showing two tabs: Standards and Plug-ins. Select the Standards tab. Here you will find displayed any information regarding the standards files associated with the current drawing, once they have been added.

To add a standards drawing, click Add

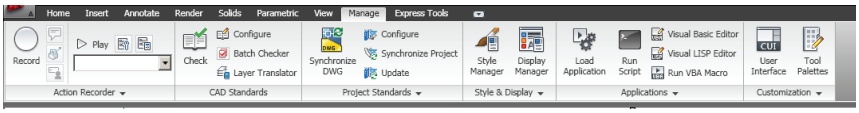


Figure 2: Ribbon Manage tab.

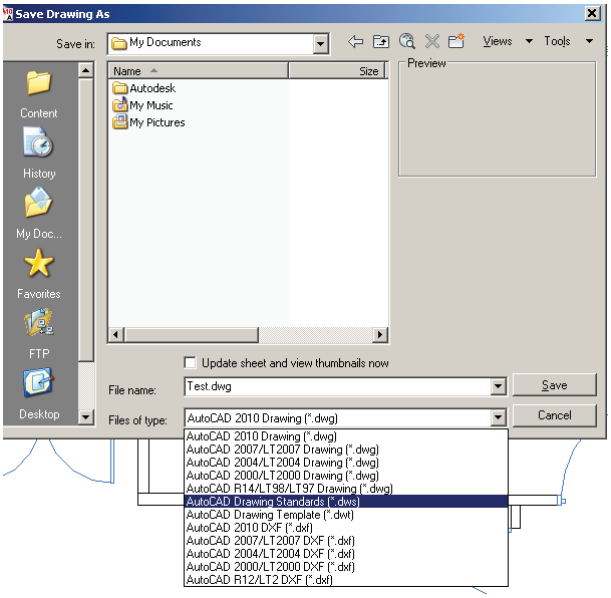


Figure 1: Saving Drawing Standards file.

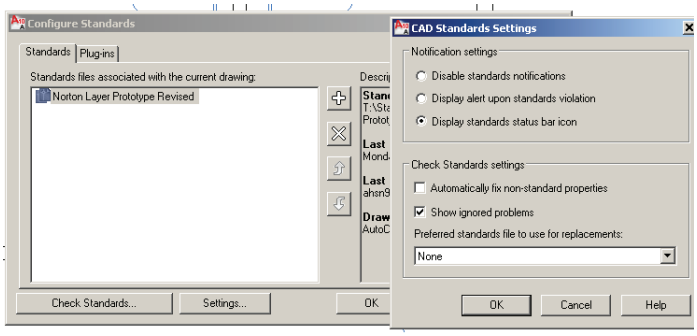


Figure 3: Dialog box with settings.

Standards. This will bring up the conventional Windows dialog box for selecting a file. Find the file you wish to use, select it and you will see that it's added to the list.

Multiple drawings can be added to the list; however, the order in which they appear is very important. If a conflict arises between multiple standard files in the list, the standards file listed first takes precedence. To rearrange the position of the standard files, highlight the file to be reordered and click Move Up or Move Down.

The Plug-ins tab lists and describes the standards plug-ins that are installed on the current system. One will be installed for each of the named objects where standards can be defined. You can specify which of the plug-ins you wish to use when you are auditing a drawing by selecting plug-ins from this list.

The Settings dialog box under Configure Standards gives you additional settings for your standards (see Figure 3). For example, you can choose to Automatically Fix Non-Standard Properties. When this item is checked, all of the properties of the objects with identical names will change to match the settings in the preferred file. You can also choose to Show Ignored Problems. When this is checked, it will show previously ignored problems when you perform subsequent standards checking. The login name of the person who previously checked it as ignored will be shown

in the Check Standards dialog along with the problem associated with the item.

There are a few notification settings you can choose from as well, including the ability to Display alert upon standards violation. Feel free to play with these settings and see what works best for you and your employees.

Checking CAD standards

Once a standards file has been associated with the current drawing, the process of auditing the drawing for standards violations can begin. This can be done immediately from the Configure Standards dialog box by clicking Check Standards. The Check Standards dialog box is divided into three main areas: Problem, Replace With, and Preview Of Changes. All of these interact with one another (see Figure 4).

The Problem area of the dialog box displays a description of a non-standard object found in the current drawing. The Replace With area of the dialog box lists possible replacements for the current standards violation. These replacements are the settings from the standard file you created and inserted into the new drawing. If there is a recommended fix available, it will be preceded by a checkmark. If there is not a recommended fix available, no items will be highlighted in the Replace With list.

The Preview Of Changes area of the dialog box will indicate the specific properties of the non-standard object that will be changed if the fix that is currently selected in the Replace With list is applied. You may also choose to check the box Mark This Problem As Ignored. When you do this, the login name of the user will be recorded with the fact that the problem has been ignored.

In some instances, you may want to move on to the next problem without applying a fix to the current problem. To do this, simply click Next. In this case, the problem will be shown in subsequent standards checks if it is not marked ignored.

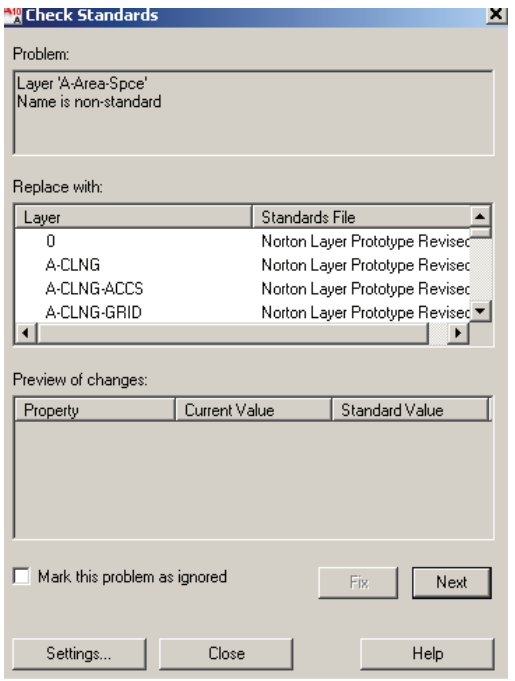


Figure 4: Check Standards dialog box.

The layer translator

The Layer Translator is another tool that helps you manage your drawings by allowing you to manage your layer scheme. It allows you to specify the layers in the current drawing that you wish to translate as well as the layers to which you will translate them.

I have found this to be extremely useful in incorporating as-built drawings from Architects into my drawings. I can translate their layers into the layers I'm familiar with, and vice versa.

The Layer Translator can be found under the Manager tab of the Ribbon, under the CAD Standards panel. Once it has been selected, a dialog box will appear that has the current drawing's layer scheme shown (see Figure 5).

Load allows you to load layers in the Translate To list using any drawing file, CAD Standards file, or drawing template file. You can also create a layering scheme from scratch in which you can enter a new layer name and assign a color, linetype, and lineweight to the layer by clicking New.

Transfer From will specify the layers that are to be translated in the current drawing. Layers can be specified through selection in the Translate From list or by supplying a selection filter. You will see a layer icon to the left of each layer name. If the icon is white, then the layer has not yet been referenced in the drawing. If the icon is dark, then it is referenced in the drawing. The Translate To list box will show you all the layers that are available for translating to and can be created from more than one drawing or from scratch.

Map is a handy tool in that it maps the layers that are selected in the Translate From list box to the layer selected in the Translate To list box. Multiple layers can be selected with this feature. With the Map Same button, no selection is needed. It allows you to map all the layers that have the same name in the two lists and update them to the same properties of the layer listed in the Translate To list. The Layer Translation Mappings list box shows each layer that is to be translated and the properties associated with each layer conversion. Here, you can select layers and edit properties by clicking Edit.

You will also notice the Settings button at the bottom left of the dialog box. This is where you can specify to translate objects in blocks, force object color to ByLayer, and so on. Be sure to check the settings to make sure that everything is as you want it.

Once all the mappings have been set up, click Translate to finish translation of the layers you have mapped. The mapped new layers and their properties will replace the old layer names and their properties. If you have not mapped some of your old layers to new layers, they will be left as they were.

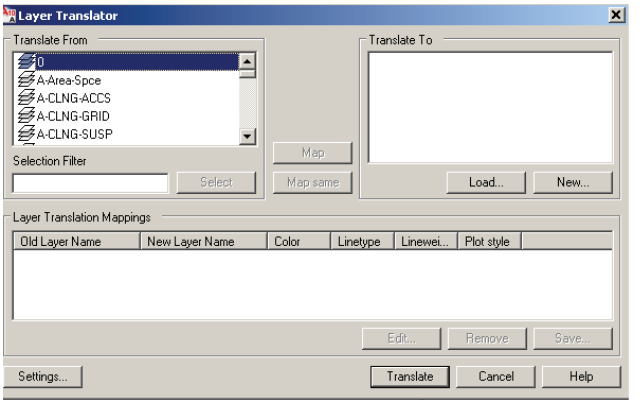
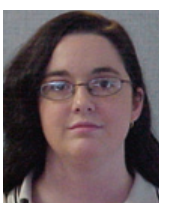


Figure 5: Layer Translator.

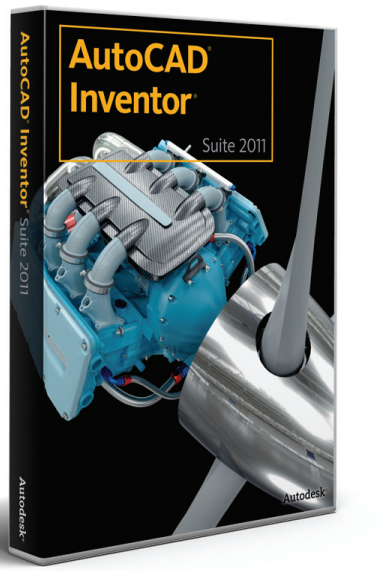
That's a wrap

Creating CAD standards gives you control over your design environment and that allows you to gain more consistency in your design projects. They make it easier for others to interpret drawings and are particularly useful in collaborative environments, where you have many individuals contributing to the creation of a drawing. Productivity will improve because standards can streamline common operations in your work area.



Melinda Heavrin is a CAD Coordinator for Norton Healthcare in Louisville, Kentucky. She can be reached for comments and questions at melindaheavrin@alltel.net.

Big Surprises in a Small Package



Updated product releases sometimes garner less-than-enthusiastic responses from the user community. Those that lack a substantial number of new features and enhancements often result in community members asking, "Why should we upgrade?"

Have you seen Autodesk Inventor® lately? Happily for the Inventor user community, with this release the question isn't, "Should we upgrade?" Rather, it is "How soon can we get the departments aligned to make the jump?"

These days I'm like a kid counting the days until Christmas. I'm shaking the box, and when no one is looking, I peek into everyone else's presents. The problem is that I couldn't tell anyone what they were getting, and it's been killing me. Well, it's Christmas morning—and I know what you got!

What's in that box

The enhancements to Autodesk Inventor 2010 were awesome and this year's Autodesk Inventor 2011 is no different. I'll summarize most of the enhancements, and discuss the following as we proceed.

Inventor Suite

- User Interface
- Sketches
- Parts
- Sheet Metal
- Inventor Fusion Integration
- Styles
- Assemblies
- Weldments
- Frame Generator
- ILogic
- Drawing Views
- General Drawing
- Drawing Annotations

Inventor Tooling

- Mold Tooling

Inventor Professional

- Dynamic Simulation
- Stress Analysis
- Frame Analysis

Vault

Other Enhancements

User Interface

Direct Manipulation Mini Toolbars

Direct manipulation is worth the upgrade alone. Autodesk applied glyphs in the graphics window that respond to the context of what is picked. These are called the Direct Manipulation Mini Toolbars. The most common commands and tools are available; simply pick a sketch or a component's face or edge and immediate commands appear near the cursor.

Various options that are in the dialog box are also embedded with it in the "In-Canvas Display," including Selection tags, Value Input Boxes, and others. Almost all the manipulation can be achieved directly at the location of work, rather than referring over to the dialog box. The traditional dialog box is displayed, but in many cases the work is completed before it becomes annoying.

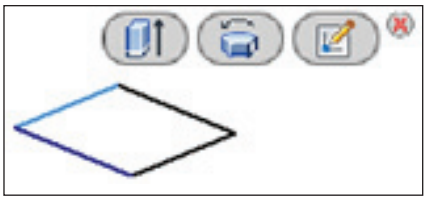


Figure 1

Pick a face and you get create sketch, edit sketch, or edit feature. Picking an edge cues the chamfer and fillet tools; selecting a sketch will bring up the option to edit the sketch or create sketched features such as Extrude, Revolve, or Hole tools.

This is a super fast way to manipulate object in Inventor.

Ribbon enhancements

Numerous improvements throughout Inventor are summarized as follows:

- Progressive ToolTips – Images that pop up while hovering over a Ribbon tool.
- ToolClips – 40 animated tooltips that replace the static ones are scattered throughout the application. Just hover over applicable Ribbon tools, such as Sweep, and the ToolClip will expand and begin to play.

Enhanced visualization tools

If you thought a shaded view was as far as Autodesk would take the graphics window, you'll be as surprised as I was.

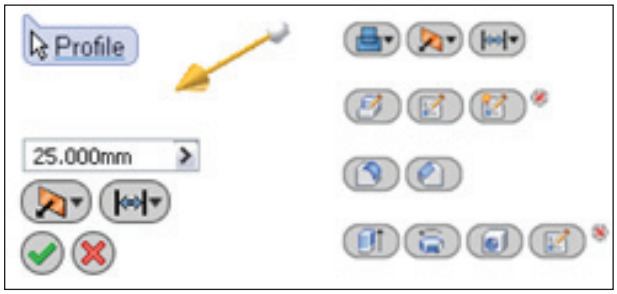


Figure 2

Visual Styles – Preset styles such as realistic, shaded, wireframe with or without hidden lines, monochrome, watercolor, and illustration are available. These are dramatic in difference and can really change the mood of how the model is being perceived by the viewer.

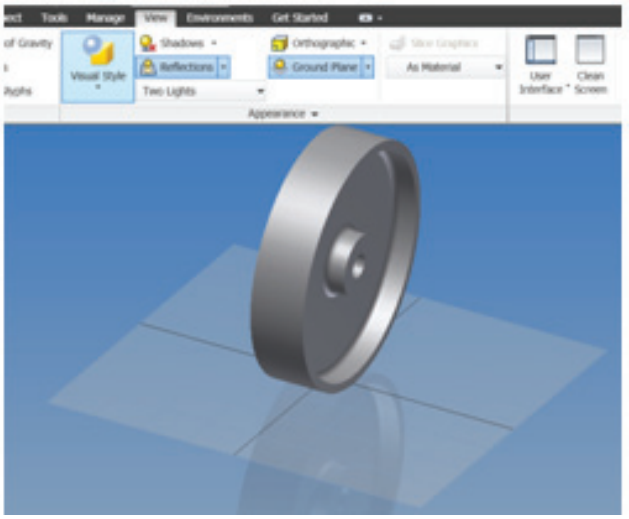


Figure 3

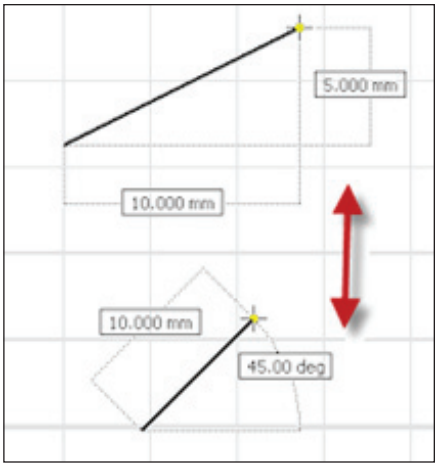


Figure 5

Figure 4

- Shadows can be toggled on and off.
- Ground Reflections can simulate a reflective environment.
- Adjustable Ground Plane that sits adjacent to your model.
- Enhanced lighting styles that affect how your model is visualized.

The usefulness of the canvas viewed project has been elevated far beyond expectations, making non-rendered, real-time presentations more appealing.

Sketches

- Automatic Home View – Inventor automatically returns to Home View after finishing a sketch. This new functionality facilitates Direct Manipulation.
- Line Close command – line command now includes a Close on a right-click menu.

Dynamic Input (Heads-Up Display)

Dynamic Input in the Sketch environment provides a Heads-Up Display (HUD) command interface near the cursor to keep your focus in the sketching area. The dimension's value input fields display as the cursor moves, while permitting the user to switch between the fields by pressing the tab key.

Parts

- Asymmetric option has been added to the Extrude and Revolve commands that permits sketch profiles to be extruded or revolved in opposite directions with different values.

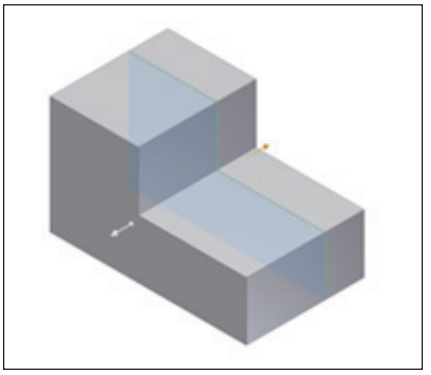


Figure 6

- "Free Move" for Move Face command– a non-parametric move type using the Triad tool.

Automatic blending

A new Inventor technique that automatically moves adjacent tangential faces and creates new blends if required.

Enhanced Work Features

The various methods available to create workplanes have been outlined in individually selectable logical Ribbon pulldowns.

Sheet Metal

- Rip Command – accepts work points, midpoints on edges, and endpoints on face vertices as valid rip points.
- DWG/DXF export – unconsumed sheet metal sketches in flat patterns.

Copy to Flat Pattern feature

This tool permits one or more 2D sketches created in a folded sheet metal part to be copied to the part flat pattern. An associative link ensures changes made to the folded model sketch are automatically reflected in the flat pattern sketch.

Inventor Fusion Integration

Inventor Fusion Technology and Change Manager

I don't know if I need to say anything more than "Fusion, baby!" I am not sure which of those gifts I mentioned were for you, but this one is MINE!

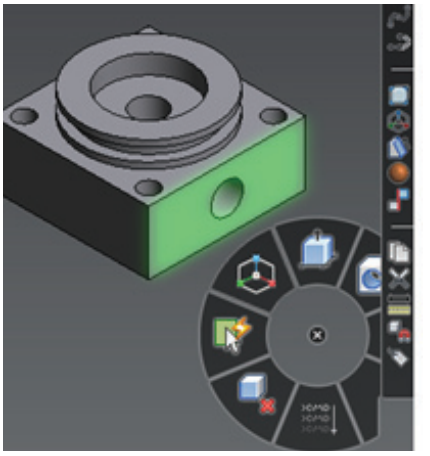


Figure 7

- Solid modeling – Install Inventor Fusion Technology and Fusion can be started when a solid part edit is initiated. The changes can be completed in Fusion, and then delivered back to Inventor when the session is done.
- Inventor Fusion Change Manager manages the changes made to an Inventor part or assembly with Inventor Fusion Technology.

Styles

Color Style editor

The Color Style editor now provides two independent sections: one for Standard Appearance definition and one for Realistic Appearance. Easy access is available through the View and Manage tabs of the Ribbon and the Quick Access toolbar.

Standard appearance styles

The same controls with enhances options are available:

- Availability of Bump settings.

- Approximate Realistic settings – permitting the resulting color style to be available for use with all Visual Styles.

Realistic Appearance Material Library

Map a color style's Realistic Appearance from the Autodesk Material Library for use with the Realistic Visual Style when you want a realistic display of the model.

The new Autodesk Material Library is shared between Autodesk products such as Inventor, AutoCAD® Revit® and Autodesk® 3ds Max.

Lighting and shadows

- Image based lighting – provides a more realistic lighting for the working environment for design reviews and when producing imagery.
- Standard lighting – now able to move with the model or camera and has individual brightness control.
- New shadow options and improved shadow control – control for direction, density, softness, and use of ambient shadows is provided and accessible through the lighting styles.

Assemblies

- File Open Options skip all unresolved files and Quick File Open can cache the opened assembly files for faster loading.
- Movement and rotation of components can be limited to a specific range determined by a preset value.

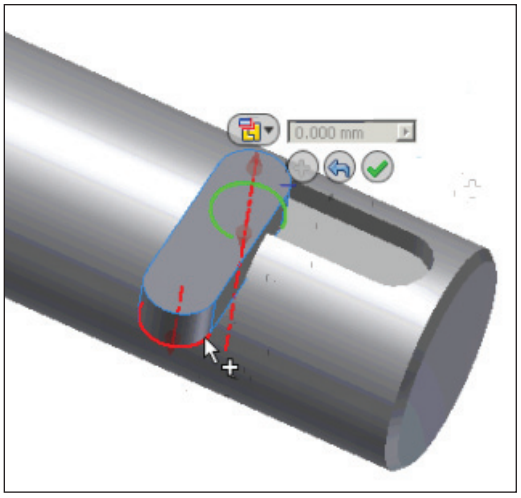


Figure 8

Assemble Command

Ahh… the Assemble command. This is a new command that to AutoCAD users is similar to the align command—making a move and rotate into a more fluid motion, but much more powerful. This tool allows the user to constrain a component into place, moving fluidly from one constraint to another without having to reissue the command.

Valid constraint types are inferred from your geometry selections and a mini-toolbar is provided to keep the motions and picking to a minimum, creating a substantially more efficient method to constrain new components. Conflicting constraints can be suppressed or deleted.

This awesome new tool is automatically active when you place components.

iCopy

This is another cool tool. I'd call it a supercharged reference copy. iCopy combines skeletal modeling and adaptivity to place copies of standard elements and resizes them automatically based on the references selected. The iCopy assemblies individually update size based on their position in the assembly.

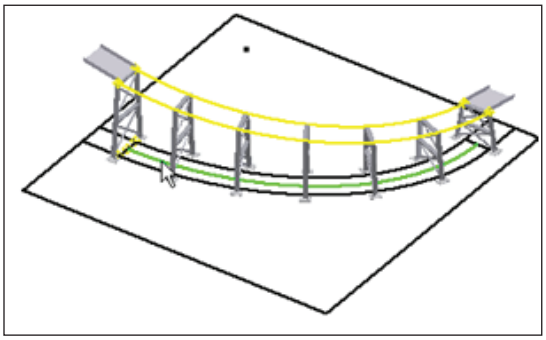


Figure 9

Weldments

Weld symbol enhancements

Symbol preview now appears in the Graphics window while creating or editing weld symbols. Vertex points can be added to provide drag movement in the graphics window.

Frame Generator

Publish Notch profiles

The Notch command is enhanced to permit notched definitions to be reused. Extrude a notch profile, convert it to an iPart, and publish to the Content Center. It can then be applied during the Notch process.

iLogic

Use iLogic rules to drive your design

iLogic comprises embeddable rules that control the behavior of your model. Using conditional statements and functions, we can control the part and assembly models based on their parameters.

Expanded parameter choices

Multiple value parameter and new parameter types enable the creation of more rules than numerical parameters could.

- Text parameters – evaluate character strings.
- True/false parameters – evaluate Boolean conditions.

Create and place unique copies of components

Using iLogic, part and assembly parameters can be affected prior to placement and then placed as unique components into the main assembly.

iLogic components can be individually modified and driven by rules in the assembly.

Use events to trigger rules

Event triggers are cool. Rules can be triggered by events such as saving a document or changing a parameter or drawing view. We can designate the order in which they run, as well.

Use code samples from iLogic tutorials

Autodesk really wants the iLogic power to spread. So the company included tutorials and provided code samples so the rules can be easily created and modified. Now anyone can quickly get moving with iLogic.

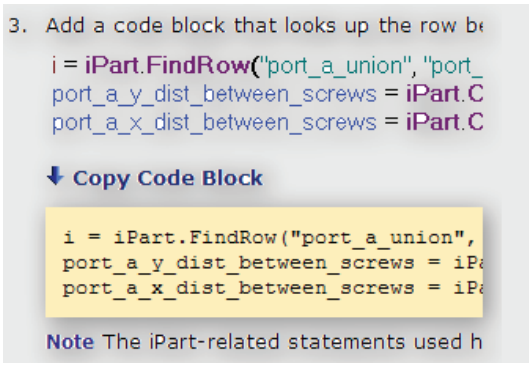


Figure 10

Drawing Views

Create multiple views

The workflow for producing projected views is substantially better, as projected views immediately project from placed base views. A check box in the view dialog permits this behavior.

General Drawing

Model reference replacement

Models referenced in the current drawing document can be replaced by selecting its replacement.

Hatch enhancements

Various hatch improvements include Section Hatch and Sketch Hatch Object styles, with overrides. Hatch patterns will automatically break around text.

Drawing Annotations

- Chain and Chain Set dimension
- Hatch text clipping
- Select all Inventor Dimensions command and Selection filter

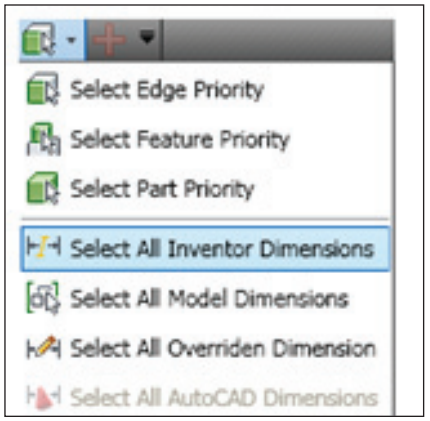


Figure 11

- Included zeros in drawing dimensions
- Retrieve dimensions in isometric views

Copy Tables

Tables can be copied from sheet to sheet by dragging them into the Browser. This includes Generic tables, Excel tables, Bend tables, iPart, and iAssembly tables.

Import AutoCAD blocks

Blocks from within existing AutoCAD DWG files can be extracted and used in the current drawing sheet using this command. A dialog displays the contents of a browsed folder and the blocks contained in the specified DWG file.

Pattern symbols and blocks

A non-associative pattern of Inventor symbols and AutoCAD blocks provides uniform copy offsets.

Rotate and scale blocks

You can manually resize and rotate AutoCAD blocks via selection grips or a static setting in the AutoCAD Blocks dialog box.

Mold Tooling

The Inventor Tooling package is also integrated with Inventor Professional installation.

- Tooling part modeling commands Copy to Construction and Bridge Curve are available to anyone that creates organic models.
- Create Core/Cavity improvements – Dedicated command performs Core/Cavity body separation through a dialog that contains Preview/Diagnose controls, Gap Repair Tolerance setting, and Parting Diagnostics.
- File naming control – added to the Mold Design browser.
- Unique pattern file option – available in the Pattern Dialog to specify whether the elements are unique or identical.

Mold kinematics

Default Positional Representations are created when you insert a new mold base. Drive Constraint on the Model browser to perform design studies while in a closed representation; the Free Drag representation provides constrained axial drag of components.

Fill analysis overlay

Air traps and weld lines can be displayed when the Fill time analysis is active by right-clicking them in the browser and selecting overlay. You can animate the Fill time with the air traps and weld lines enabled, and export the graphics to dwf.

Automatic surfacing

Create patching surface and runoff surface using either picked edges or Auto Detect.

Dynamic Simulation

- Joints highlight in graphics window when subassemblies are selected in the Dynamic Simulation browser.

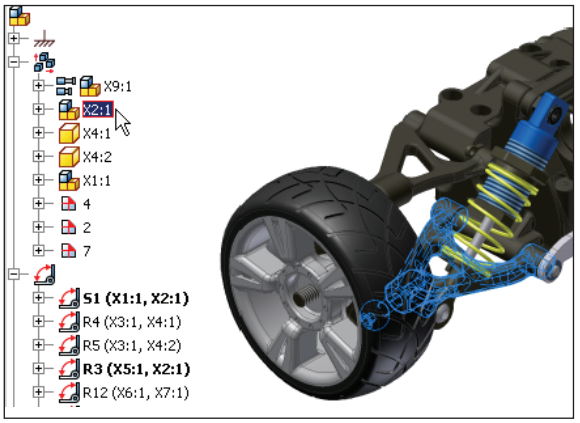


Figure 12

- Display mechanism status – Mechanism Status and Redundancies dialog can display while the simulation is running.

Stress Analysis

- Simulation Guide – Interactively assists in the preparation of your model and interpretation of simulation results.
- Workflow enhancements – Contextually add loads, constraints, and manual contacts in the browser. The Apply button is included to help move smoothly through the process.
- Work with materials – View all material assignments, not just the material overrides. Material assignments made at the part level and material overrides are shown in the browser as children of the respective material nodes.
- Various warning and status icons and displays.
- Inquiry label can be manipulated.

Assembly and part simplification

Analysis speed can be increased substantially by excluding parts and sub-assemblies. This is quite convenient, especially when creating different numerous different simulations in the same assembly.

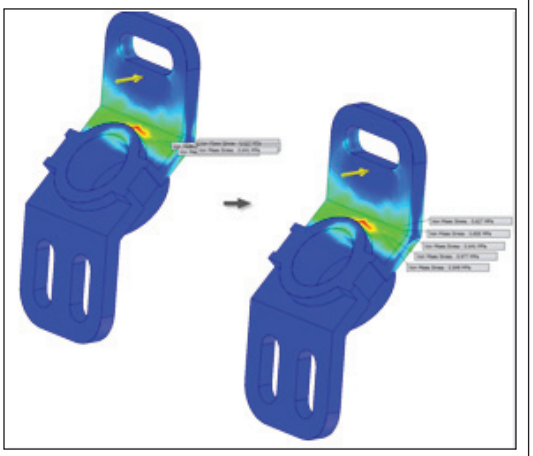


Figure 13

Mesh failures can be pushed past by excluding the affected components and continuing without addressing the issue.

Frame Analysis

A fully integrated Frame Analysis has been added to the environments to complete the Inventor Analysis suite. The Frame Generator parts are automatically recognized and converted into idealized nodes and beams. Mechanical properties and loads can be applied to establish the conditions desired.

Deformations, stresses, moments, and detailed beam results can be analyzed and visually inspected. The displacement and stress results can be animated.

Additionally we can:

- add Constraint and Load definitions, and assign connections.
- create multiple simulations in one document.
- override materials and physical properties.

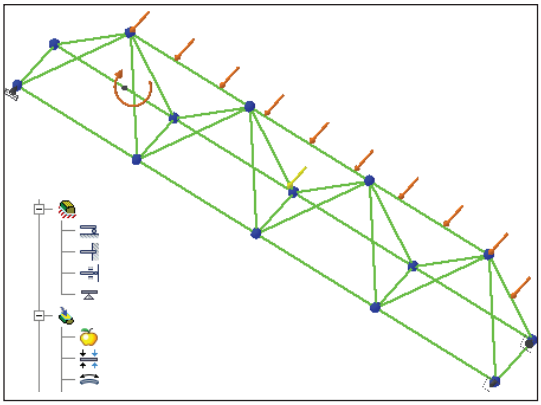


Figure 14

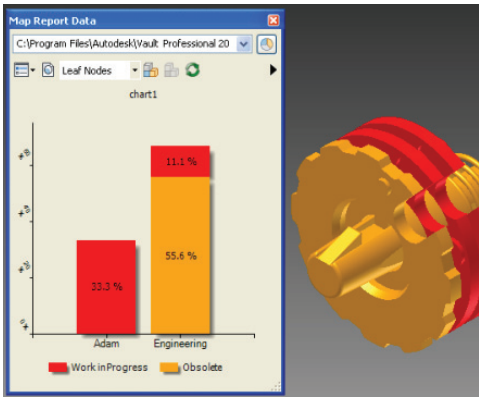


Figure 16

- exclude components from the simulation and evaluate changes from the Frame Generator.
- generate custom force diagrams.
- export data to RTD for use in Autodesk Robot Structural Analysis Professional.

Vault

- Auto-numbering – Client configurable character scheme is appended to the file name when a file is initially saved. Available for Create Component, Save, Save As, Save All, and Make Layout.
- Data Cards – Vault status and property information at your fingertips with the new Data Cards feature.
- Data Mapping – an interface that permits us to publish a report as various chart types within Inventor. The user can then see the direct correlation between the report results and the open model.
- In-context Add-in Menu – this Data Card- supported feature provides access to all necessary Vault commands through a handy context menu.
- Report Generation – allows us to generate reports based on vault data.
- New hotkeys have been introduced.

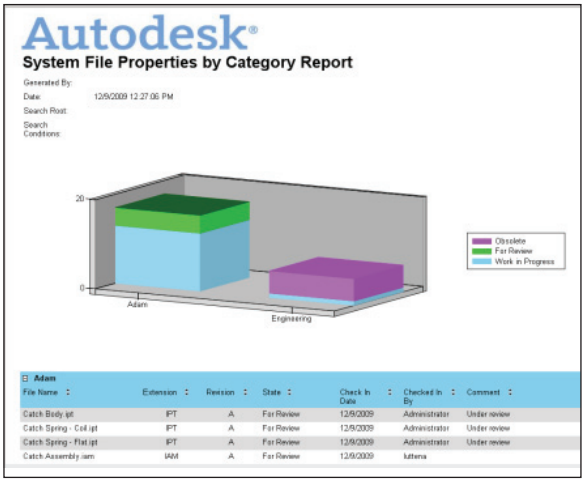


Figure 17

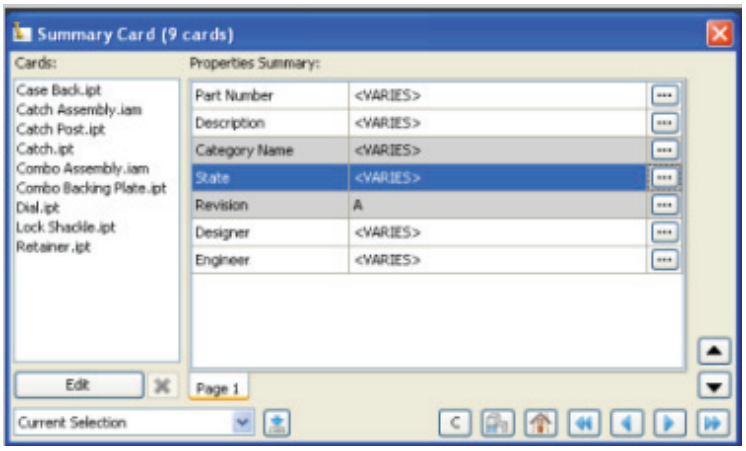


Figure 15

Other Enhancements

- Architectural and fractional unit support in parameters and Drawing Views.
- Routed System and Simulation Getting Started Guide changes and PDF content.
- Various tutorials have been added and expanded.
- Initial View Extent settings.
- Search capabilities added to Export component type.
- Inventor Sample files relocated to www.autodesk.com\inventor-samples.
- Autodesk 3D Print Service Web page produces quality STL data and sends to a 3D print provider.
- Shrinkwrap Assemblies Task Scheduler and import/ export translator enhancements.
- Various improvements in data translation and export.
- Customized info tips for Inventor files.
- Help home page enhancements.
- Content Center received enhancements in publishing and migration.

John Evans is an Autodesk Certified Inventor Professional living in the Florida Panhandle, where he provides technical troubleshooting at Gustin, Cothern, and Tucker, Inc. His career through the Aerospace Design, manufacturing, and maintenance spans 24 years and includes a tour in the USAF. John now works as a design consultant and author from his company John Evans Design and manages the blog "Design and Motion", where he combines his passions: Autodesk Inventor, simulation, and motion control. He is a regular attendee of Autodesk University and has recently joined Tekni Consulting as a contributing author for the Creative Inventor training series. He can be reached at john@johnevansdesign.net.

Editorial review provided by:

Daniel Banach is an Autodesk® Inventor® Certified Expert, a nationally recognized instructor, and a longtime speaker at Autodesk University. He has been providing CAD solutions to clients of MasterGraphics (an Autodesk Premier Solutions Provider and Autodesk Authorized Training Center) for 17-plus years. He has authored three books on Autodesk Mechanical Desktop® and is co-author of twelve books on Autodesk Inventor. Dan has consulted with Autodesk on many projects. Dan has also created Autodesk Inventor computer-based training videos for CADLearning™.

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Enhance Your View

Many of us have battled printers and plotters in the last minute to present designs to clients, associates, or other team members. And as Murphy's Law reminds us, everything that could go wrong ends up going wrong at printing time. You print your design because you want to leave the recipients of the information with something they can take with them and analyze at their convenience.

Unfortunately, sharing a digital design model may not be the best method when you consider that not everyone will have the required software and hardware required to view the file or may be unfamiliar with the technology. Consider how a client who has never seen Autodesk Revit would feel if you sent a Revit Model. How could the client review the design and understand it?

Design Review has made it easy to share complex design information with those who do not have access to your design tools. As a result, Design Review has helped project teams accelerate their processes and define new workflows to save time and money. Many firms who have adapted Design Review in their environments report improved process efficiencies and reduced costs while being able to communicate design ideas more clearly than ever before.

With Design Review you can markup and measure designs created from different software platforms. Design changes are easy to communicate and track, forming a bilateral communication between designer and reviewer. And it keeps getting better.

The new Design Review 2011 continues to improve this communication with its new features. Here is a quick peek at these new features.

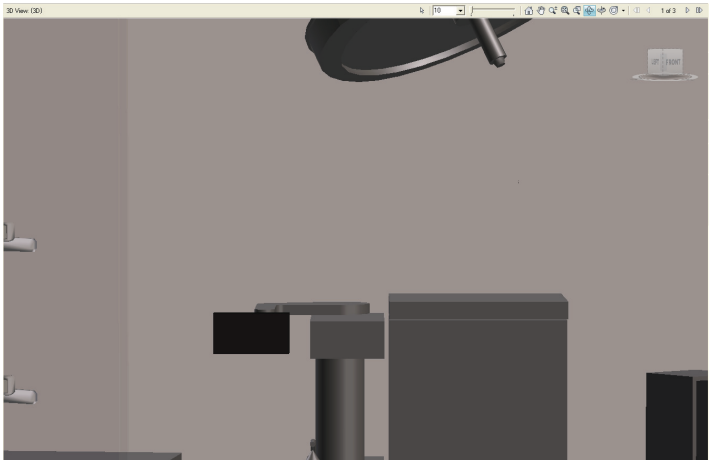


Figure 1: Field of View set to default value.

Figure 2: Increase Field of View.

Field of View

The first time I used Design Review I was amazed that I could navigate through my model. Yet it took me a while to get used to the navigation tools as I was trying to get a better view of each area of the model. The new Field of View lets you control the visible area of a view from a set location, allowing you to see the space at wider angles.

As you can see in Figure 1, the viewable area is limited and you cannot appreciate the space. The field of view is set to 10, which is the default viewable area.

By simply changing the field of view to 95, using the slider control (see Figure 2), you can get a better appreciation of the space without having to move your point of view.

Increasing the field of view also helps you navigate the model more easily because you are not viewing objects at such close range. Thus, you do not get that "wusshh" effect of seeing objects fly right by you. Plug in a 3D mouse and you will have a nice time navigating your model. I am sure a client would be very excited about playing with Design Review after seeing what it can do.

Simplified lighting tools

The lighting tools are located under the extended View panel of the Home Ribbon bar. In the previous 2010 release, this tool included the following

lighting options: Headlamp, Bright, Daylight, Night Time, Primary, Blue, Red, Engineering, and Published Lights. Frankly, I couldn't figure out how or when to use some of those options.

By contrast, the lighting tool in the newest release is simpler and easier to use. It contains the following options: Default Lights, Headlamp, Published Lights, and No Lights.

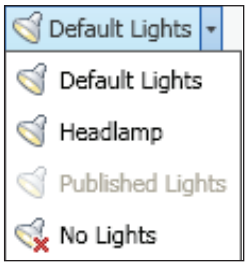


Figure 3: Simplified lighting tools.

These lighting options give you better visibility of your model as they correct some of the glare and over-lighting experienced in previous versions.

Keyboard shortcuts

You can invoke markup tools faster now with keyboard shortcuts. Only a few shortcuts were available in the previous release. In Figure 4, I highlighted with red rectangles the markup tools that have been assigned new keyboard shortcuts. In the first group, reading from left to right, the tools can be called using the CTRL + Num key combination. For example, the keyboard shortcut for the Rectangle Callout tool (top left corner) is CTRL+1. Then the shortcut numbers increase sequentially from left to right, top to bottom. The tools in the second highlighted area use the SHFT + Num key combination. All other tools use single letters—easy to memorize.

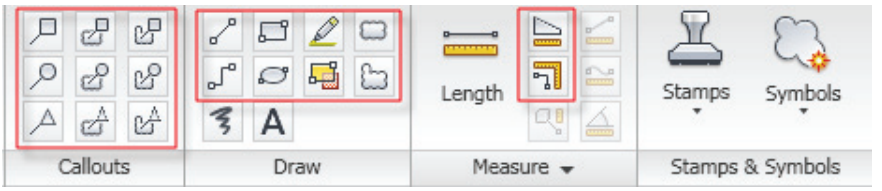


Figure 4: Keyboard shortcuts for all markup tools.

More advanced printing controls

The printing dialog has been enhanced with more advanced printing controls that improve raster printing performance.

The options under the Resolution area of the Advance Print Options window allow you to define the quality of the print. Click the User Defined option to change the DPI resolution setting. Be careful not to set the resolution too low when printing graphics because objects might start to lose definition and merge with nearby objects. This is particularly true when printing sheets of building construction documents and other graphics that contain fine lines and curves.

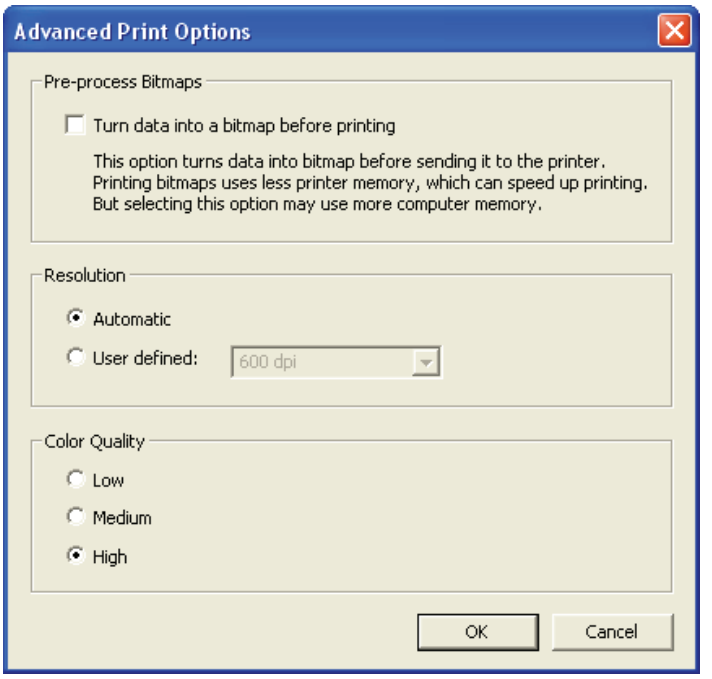


Figure 5: More advanced printing options.

The Color Quality area of the Advance Print Options window contains options to control the color quality to low, medium or high.

All these options give you better control of the quality and speed of your print jobs. This is particularly useful when printing a large number of sheets.

Open dialog—all supported files

The Open dialog has been enhanced also. In the previous release, the Files of Type selection list defaulted to 'All DWF Files.' It was easy to miss that Design Review can also open the following file formats: DWG, PDF, BMP, CAL, CG4, GP4, JPG, JPEG, JPE, JFIF, PCX, PCT, PICT, PNG, RLC, TGA, TIF, TIFF (Note: To view DWG files in Design Review you must have the same product year of Autodesk DWG TrueView installed as well.)

In Design Review 2011 the Open dialog Files of Type list defaults to 'All Supported Files,' allowing you to see at one glance all the different files you could open.

As building information modeling continues to spread throughout the construction and design industry, the advantages of using Design Review become readily apparent.

Many design firms are finding significant savings in software costs by providing Design Review to project managers and construction administrators for review and markup of documents. The intelligent data that can be included in DWF files, from 2D documents to 3D models can make their work easier and faster.

Design Review is easy to install and does not have the expensive hardware requirements most design software tools have, making it very easy to transport and use in the field. Best of all, it's free.

Felix M. Gonzalez is the CAD Manager and Medical Equipment Planner for HuntonBrady Architects, PA. in Orlando, Florida. He has a bachelor's degree in computer programming and has been working with Autodesk products for 20 years. Felix can be contacted at fgonzalez@huntonbrady.com.

Creating a Tapered Concrete Column Family

One of the most powerful capabilities inside Autodesk® Revit® Structure is the family editor. The family editor allows the Revit operator to create custom content that is not readily available in the content library or on the Internet. This article will take you through the process of creating a custom tapered concrete column family. You will gain enough knowledge to create other content using some of the same tools that will be explained.

Selecting the template

Figure 1: Create a New Family.

When you first launch Revit Structure, you have a choice to open or start a new project. You also have a choice to open or start a new family. Figure 1 shows the selection made for creating a New family.

Once you tell Revit Structure you wish to create a new family it is important to select the correct template file to begin. Revit Structure ships with all the standard templates required. Selecting the column template would be appropriate even though you could create a column with a generic model template. By selecting the correct template, the family will behave like a column. It will have the same visibility controls and lineweights as other "out of the box" column families in your model.

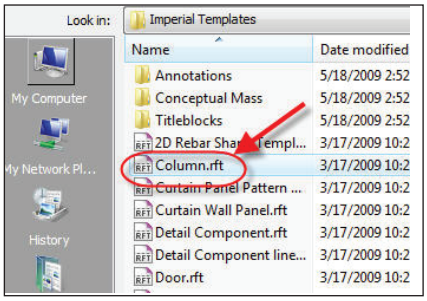


Figure 2: Selecting the Column Family Template.

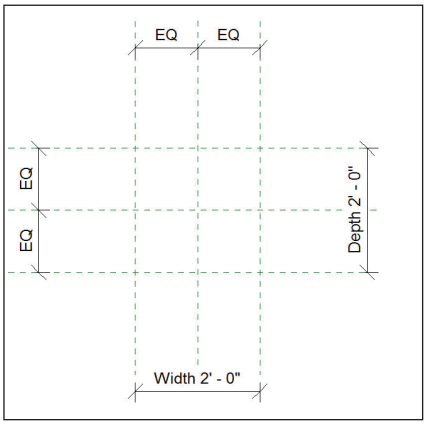


Figure 3: Column.rvt

Column template

The column template opens up in a plan view (Figure 3) and has a few values and reference planes already established to get you started. The width and depth are family types that give you control over those values. There are also reference planes defining the centerline and exterior constraints of your column.

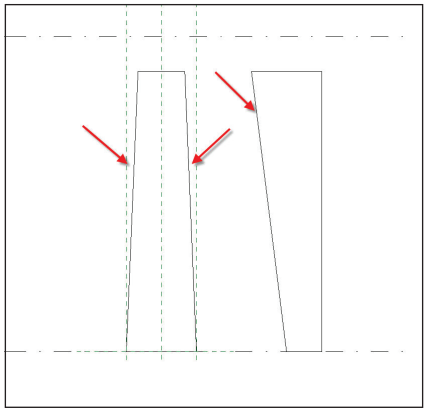


Figure 4: Tapered Column conditions.

The dimensions and reference planes are essential for giving you control over the column you wish to create. Without them you would create a stagnant column that would not be parametric.

The next step is to determine what parts of your column need to be adjustable (parametric). Also, does the column taper on all four sides, or just one side? Figure 4 shows two types of tapered conditions.

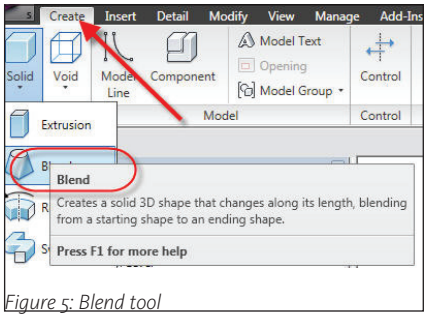


Figure 5: Blend tool

The one on the left has the column tapering on all four sides and the one on the right shows only one side of the column that is tapered.

Both of these columns were created using a Solid Blend extrusion. Below are the steps necessary to produce a column that is tapered on all four sides. In the column family we will be able to control, width, depth, height, and tapered distance from edge.

Select the Blend Tool from the create panel as shown in Figure 5.

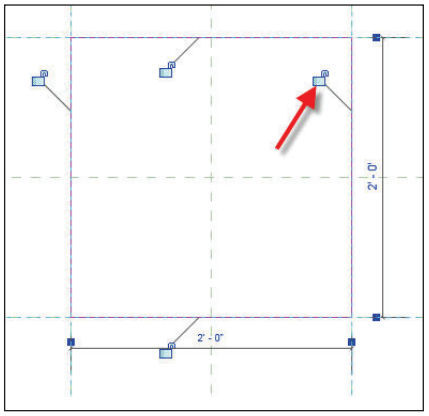


Figure 6: Lock in sketch

Once the Blend tool has been selected, Revit will place you in a sketch mode. This first Sketch mode is for the Base of the

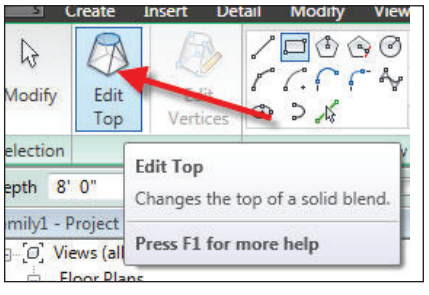


Figure 7: Edit Top

column. Draw a rectangle, using the reference planes as your guide. Once you draw the rectangle, a "lock" icon will appear on each line. This lock icon, when selected, will lock in the location of your sketch line. By locking your sketch line you are creating a relationship with the reference plane. This will allow the base of your column to adjust with the depth and width instance properties of your column family.

Once the base sketch of the column is

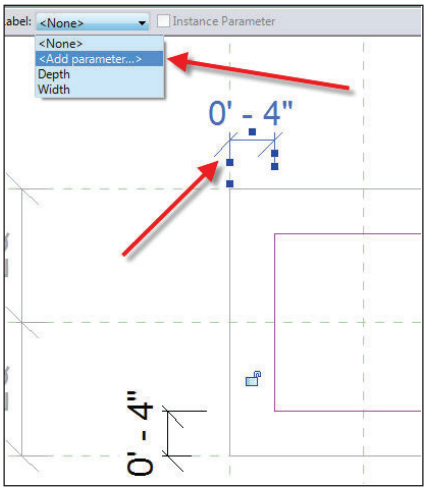


Figure 8: Creating a parameter

complete you need to sketch the top. Select the 'Edit Top" tool from the Create Blend Base Boundary ribbon Panel.

Sketch a rectangle that represents the top of the column and dimension all four sides. At this time you have a choice to fix this dimension or make it adjustable. Depending on the structural requirements you may need this distance to be variable. To do this, you need to turn the dimension into a parameter. Select one of the dimension, and then select "add parameter" from the label drop-down menu as shown in Figure 8.

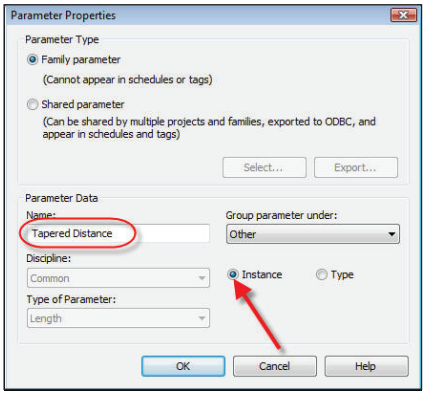
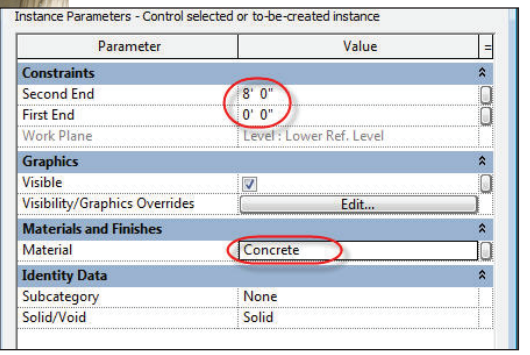


Figure 9: Parameter properties

Figure 12: Blend properties



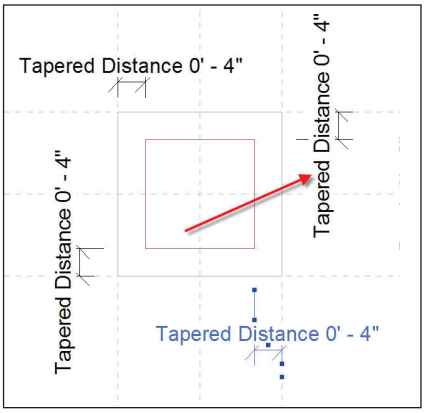


Figure 10: Tapered distance parameter assignments.

Adding a parameter

This will launch the parameter properties dialog. Call the parameter "Tapered Distance" and make it an instant property. This will allow control over each instance placed versus a global family type modification.

Once your parameter properties are set, assign the parameter to all four dimensions by selecting the dimension and then selecting the label from the drop-down.

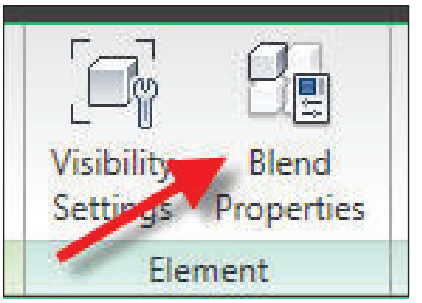


Figure 11: Blend properties tool

Blend properties

To complete the Blend you need to assign the last of the properties. These properties will include assigning a height and a material. Select Blend properties from the Create Blend Top Boundary ribbon panel.

In the blend properties dialog box set the top of the blend to 8'-0" and the material to concrete. Once the blend is complete you can create a height parameter so it is adjustable. Also for scheduling purposes, you may want to create a different material. For Instance: "Column Concrete." Now you can have a separate schedule pulling that material out of the model, keeping it isolated from other concrete takeoffs.

To create the height parameter, change to a front elevation and create a column height parameter using the same method as above when creating the tapered distance parameter. Figure 13 shows the parameter settings.

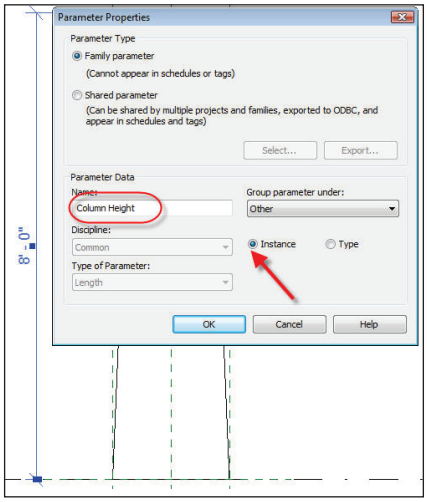


Figure 13: Column Height settings

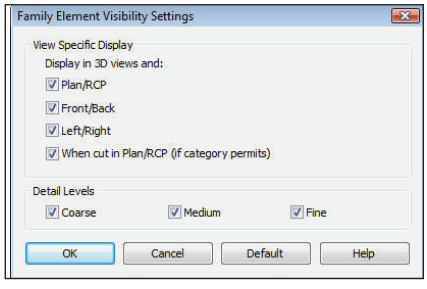


Figure 14: Visibility Settings

Visibility

Before you complete your column you may want to determine the visibility settings. This column may not need to be viewed from certain directions. Sometimes, extra detail will be added for the purpose of a nice 3D model; however, in plan view you do not wish to see all the extra detail. To control the visibility of the item selected, pick the visibility settings tool from the ribbon panels. This will launch the Family Element Visibility settings dialog box. In this dialog box you can toggle off different views so you view only what you want to see.

Flex the family

All the parameters are in place and ready to test. Switch to a 3D view and then open up the type properties from the detail ribbon panel.

Once the family types dialog box comes up, change some of the type parameters to test your column family. First change the width and depth under the dimensions heading. When you click OK you should see the base of your column adjust. Then try adjusting your column height and Tapered Distance to make sure they work as you expected.

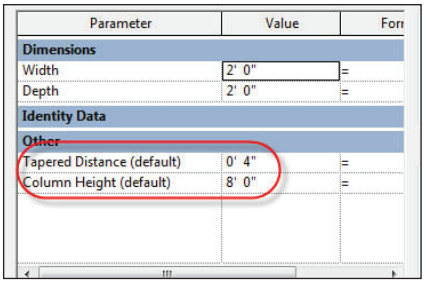


Figure 16: Family Type parameters

Creating family types

Creating different family types is beneficial when your column family is loaded into a project. Different column sizes will be available to choose from without the need to adjust the parameters. However, if a unique size is needed that you didn't

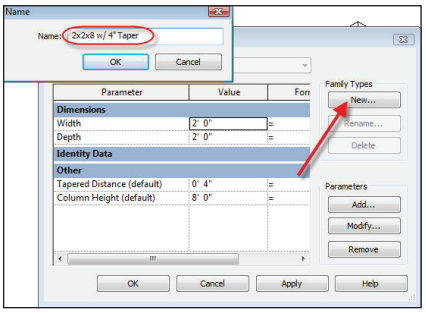


Figure 17: Family Types

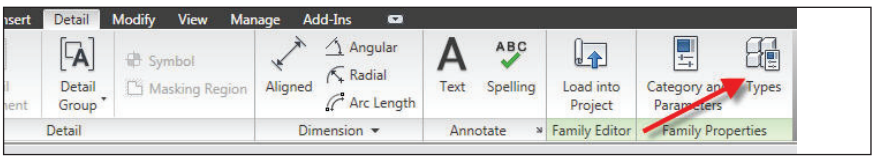
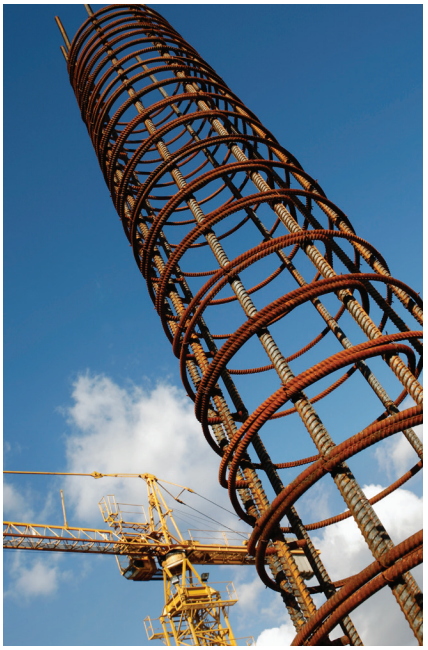


Figure 15: Family Types tool



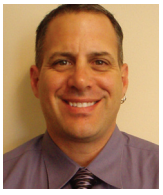
pre-establish, the capability of the family is built in.

Tips & guidelines

When creating a family, try to flex the family with every parameter you create. Once you are comfortable in the family editor it is not difficult to over-constrain a sketch and not know what caused the problem. Testing each parameter as you create it will assist you in troubleshooting more efficiently.

In the beginning it is important that you have a clear understanding of how your family is going to be used. Decide what parametric parameters you need, what material the family is made of, and what directions the family needs to be viewed from. Knowing this ahead of time will ensure a great outcome.

Develop a naming convention for your family content. This will make it easy for other users to understand what your families are used for.



Phil Russo began with AutoCAD version 2.5 in 1986. Through the years, he has held positions in the CAD industry as CAD draftsman, CAD manager, applications engineer, and Autodesk Certified Instructor. Lately Phil's focus has been on the development and implementation of standard practices for the Autodesk Revit product line including Revit Architecture, Revit Structure, and Revit MEP. He currently works at Lindemann Bentzon Bojack, an architectural and engineering firm located in Clermont, Florida. He can be reached at philr@lbbe.com.

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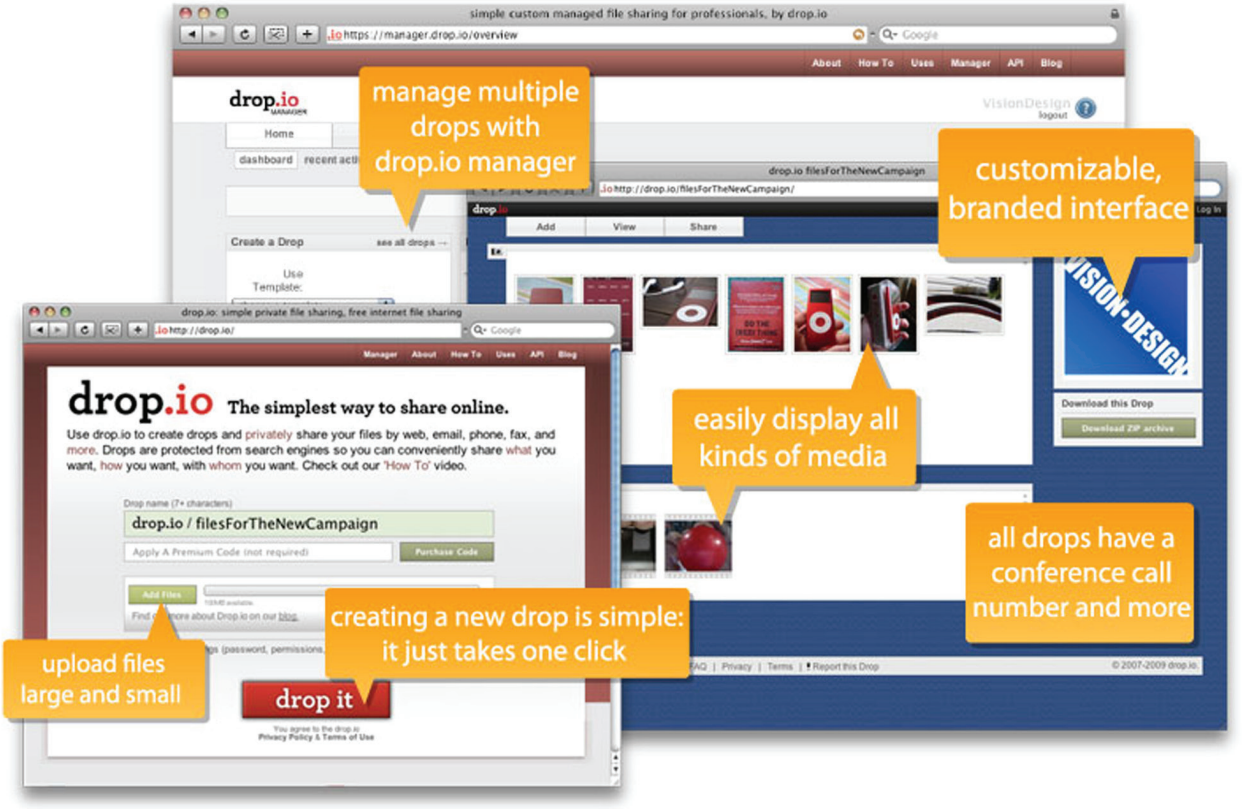

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Ladders, Step by Step

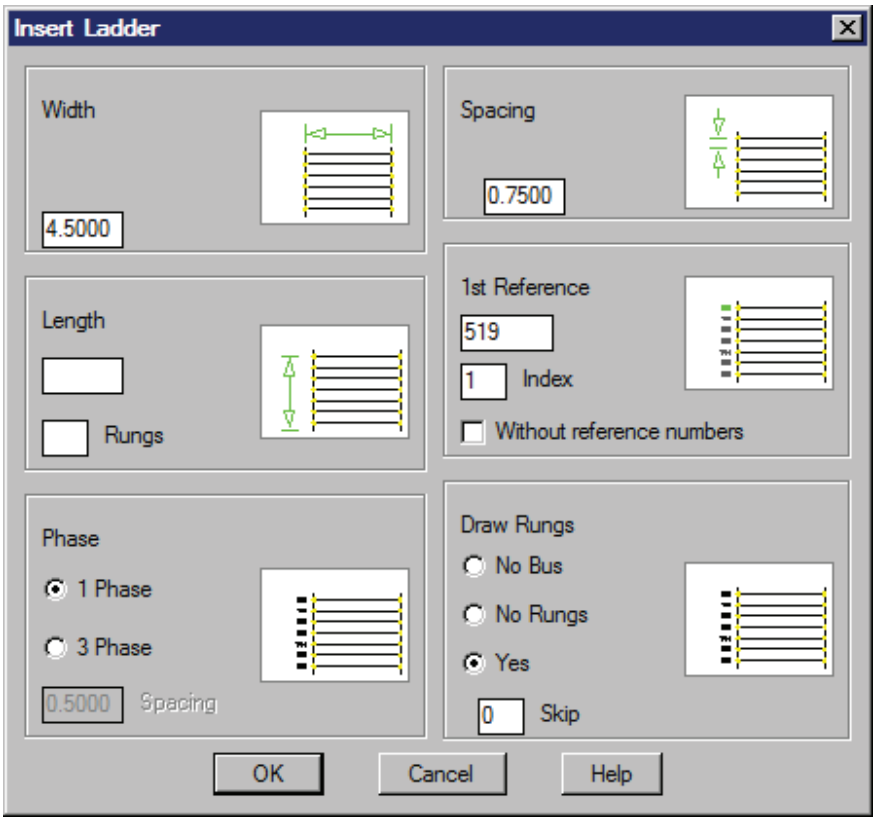

Figure 1: Insert Ladder dialog box.

The Insert Ladder tool in AutoCAD® Electrical 2010 is used to insert a ladder in a drawing. First, click on the Insert Ladder button from the Insert Wires/Wire Numbers panel of the Schematic tab; the Insert Ladder dialog box is displayed, as shown in Figure 1. This dialog box consists of various areas and options, which are discussed below.

Width

In the Width edit box, you need to specify the width of the ladder.

Spacing

In the Spacing edit box, you need to enter the spacing between two horizontal rungs of a ladder.

Length

In the Length edit box, you can specify the length of a ladder, which in turn will automatically calculate the number of rungs of a ladder. This is the alternate option. It depends on you whether you want to enter length of the ladder directly for inserting the ladder or you want to specify the number of rungs.

Rungs

In the Rungs edit box, you can specify the number of rungs. But if you have already specified the length of a ladder in the Length edit box, the value of rungs is calculated automatically and is displayed in the Rungs edit box.

1st Reference

The 1st Reference edit box is used to specify the first line reference for a ladder.

Index

The index value is used to increment the line reference number of a ladder. Enter the required index value in the Index edit box to increment the line reference number of a ladder. By default,1 is displayed in this edit box.

Without reference numbers

The line reference number of a ladder are not displayed if you select the Without reference numbers check box. By default, this check box is cleared in the dialog box.

Phase

The options in the Phase area are used to specify the phase of a ladder. These options are discussed below.

1 Phase

The 1 Phase radio button is selected by default. This radio button is used to create one-phase ladder.

3 Phase

The 3 Phase radio button is used to create three-phase ladders. You will notice that when you select the 3 Phase radio button, the Width and Draw Rungs areas are not activated in the Insert Ladder dialog box, as shown in Figure 2.

Draw rungs

The Draw Rungs area is available only if you select the 1 Phase radio button from the Phase area. This area is used to specify the way you want to draw rungs. The options in the Draw Rungs area are discussed below.

No Bus

The No Bus radio button is used to draw line reference numbers only.

No Rungs

The No Rungs radio button is used to insert vertical rails and reference numbers of a ladder without rungs in a drawing.

Yes

The Yes radio button is selected by default and is used to insert rungs, reference numbers, and vertical bus automatically in a drawing.

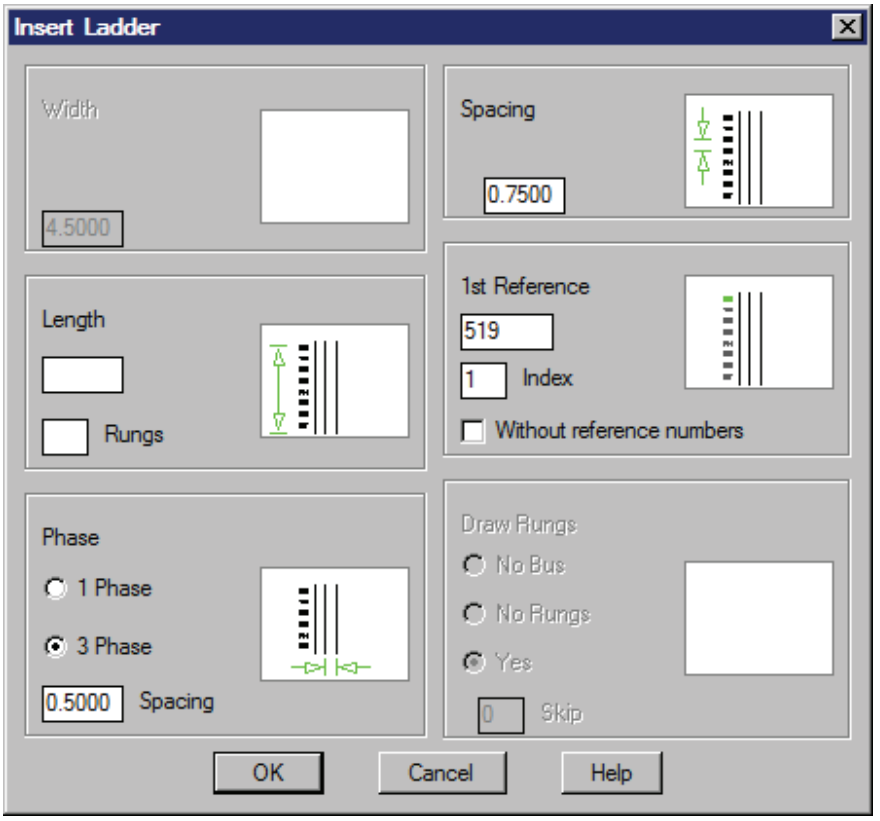

Figure 2: Insert Ladder dialog box when 3 Phase radio button is selected.

Skip

In the Skip edit box, you can specify the number of rungs that you want to be skipped.

After you specify the required options in the Insert Ladder dialog box, choose the OK button; you are prompted to specify the start position of the first rung. Specify the starting point of the first rung and the ladder is inserted into your drawing. You can also insert a ladder into your drawing manually. To do so, you need to leave the Rungs and Length edit boxes blank.

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