



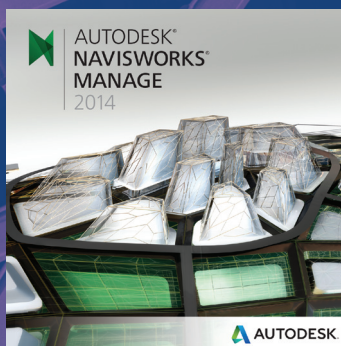
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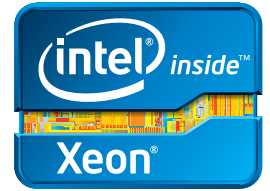
What's New from Autodesk 2014



Also in this issue:

- Inventor Gets Social
- Behind the Scenes in AutoCAD MEP
- Better Model Definition with Revit Structure

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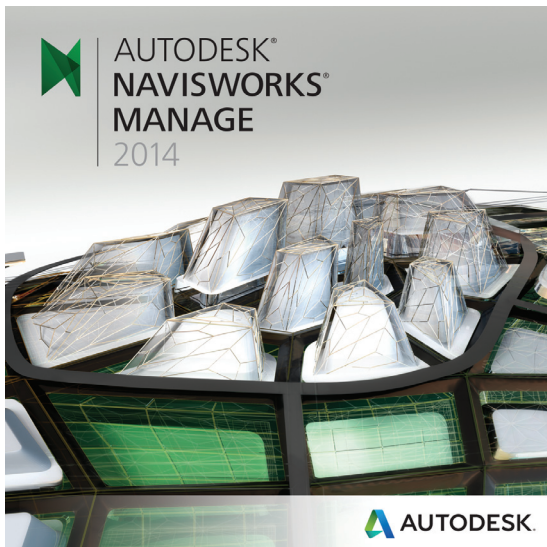
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Editor's Note



AUGI



Hello, Dear Reader!

Happy Holidays! For the Autodesk community, the annual release of new software is indeed cause for celebration. Like kids with new toys, our authors have removed the wrapping and busied themselves testing and playing with the new software. Within these pages they offer up their personal experiences and insight. Some things are wonderful; some things could use a second look. After all, nothing is perfect, especially software.

So we start out with Brian Benton, who just can't stop writing, sharing his thoughts on what is new and improved in AutoCAD 2014. This program has a very long history indeed. And our sidebar this month, by Michael Beall, uncovers how to hide and isolate work. Next we have John Evans, our manufacturing guru, who talks up what's new in the Inventor 2014 article. John's article is a show-and-tell: packed full of commentary and illustrations about Inventor's many new and enhanced features.

Then we jump to the Revit timeline so that Jay Zallan and Marcello Sgambelluri can explain what is new and exciting in Revit Architecture 2014. Of course, a good deal of the subject matter is "platform," so even users of those other verticals should give this a read as well. Next author Elisha Sage goes behind the scenes in AutoCAD MEP 2013 and discusses customization and more. And our own Philip Russo takes a steely eyed approach to his review of the new release of Revit Structure 2014. If you don't do structure, feel free to just "frame" the pages.

Moving on to Civil, BIM and all things 3D, author Andrew Walther makes a meal of the new features in AutoCAD Civil 3D 2014 while he describes what it is in store for us. And then our own Michael Smith puts what is new in Navisworks Manage 2014 to work and colors his article with materials and takes off for the skies! Groan, my puns are failing me. Jumping back to the Revit world one more time, Todd Shackelford puts an eagle eye on what is new in Revit MEP 2014. From what I can tell, his article is very, very energized.

Rounding out of this wonderful issue of *AUGIWorld*, And finally in our monthly Inside Track we welcome a new author! Lee Ambrosius has returned to *AUGIWorld*. You may remember Lee from a few years back as our AutoCAD author. He has now taken up the task to keep us in the know about all sorts of new products coming to market.

And that is it! Get ready to get upgraded and informed with this newest issue of *AUGIWorld*.

Take care,

David Harrington

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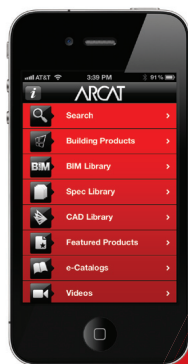




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What's New in AutoCAD 2014

Autodesk has released the latest version of its flagship design program AutoCAD® 2014. AutoCAD 2014 is the 28th release of AutoCAD and is noted as being version 19.1. It continues with the AutoCAD 2013 .dwg file type and format and is supported on Windows XP, Windows 7, and Windows 8 operating systems. No official support from Autodesk will be given for Windows Vista. AutoCAD 2014 continues Autodesk's reach for the clouds with its integration of Autodesk 360, new geographic location tool, reality capture, design feed, and increased control and management exchange apps. Autodesk also makes an attempt to protect us from malicious files with the Secure Load tools, but they are tricky to use and will potentially be a sore spot with CAD and IT managers. Now let's take a look at these new features.

THE USER INTERFACE

Autodesk recently adopted a new logo and branding. Figure 1 shows the new Application Menu Icon for AutoCAD 2014 along with the new file tabs.

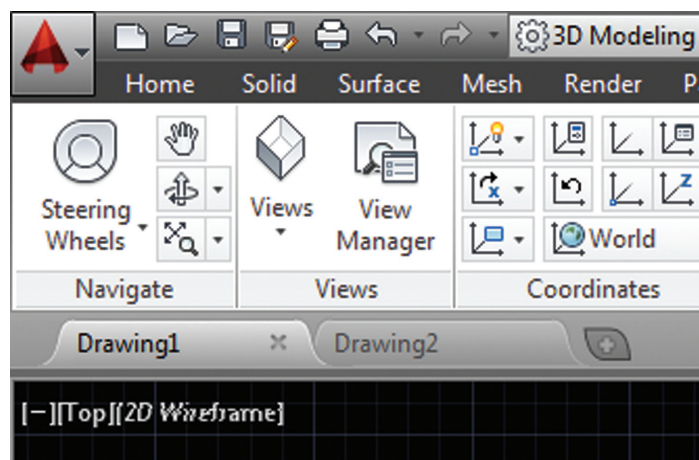


Figure 1: The Application Menu is updated to reflect Autodesk's new branding. File Tabs can assist in file navigation and creation.

The File Tabs are a carryover from a third-party add-on and are now part of AutoCAD. Click on a tab to access the file, right-click

on a tab to open, save, or close a file or files. The Plus Sign on the right will start a new file or open one. Clicking on a tab while it is active will give you a preview of the file's model and paper space tabs, providing quick access. Click the File tabs button in the ribbon on the View Panel to toggle these tabs on or off.

THE COMMAND LINE

The Command has been enhanced with several "auto complete" features. There is a new Autocorrect that will help you spell commands properly. Auto complete will provide a list of commands with your typed text no matter where that text is in the word. The program formerly only displayed commands that started with your typed text. Typing SETTING will display many more commands than in previous versions.

The command line now has Adaptive Suggestions. AutoCAD will learn which commands you use most often and display them first in the auto complete feature. You can also take advantage of Synonym Suggestions. These are alternate strings of text that can be typed in place of the command. Type ROUND to start the fillet command. This list can be edited using the Edit Aliases tool in the Manage tab in the ribbon. When AutoCAD provides you a suggestion for a command you are typing, there is an icon that you can click to open either Help or to perform an Internet Search for the command.

The command line also has access to layers, blocks, hatch patterns, text styles, dimension styles, and visual styles. If you type BOLT and there is a block in the file named BOLT, the Insert command will start with the BOLT block ready to go. Expandable categories are available in the command line to make it easier for users to navigate. You can customize the behavior of the command line's suggestions by using the controls in the Input Settings menu. Right-click in the command line to gain access to this menu.

There are a few small things added that many users will like. The number of layers displayed on the ribbon has been increased, and layers are now displayed in a natural order, meaning that layers numbered 1, 6, 32, 16, 3, and 225 will be sorted 1, 3, 6, 16, 32, and 225. Before, they would be sorted 1, 16, 3, 32, 6, and 225. The new Merge Layer option in the Layer Manager allows you to merge all objects on multiple layers to one layer while purging the other layers.

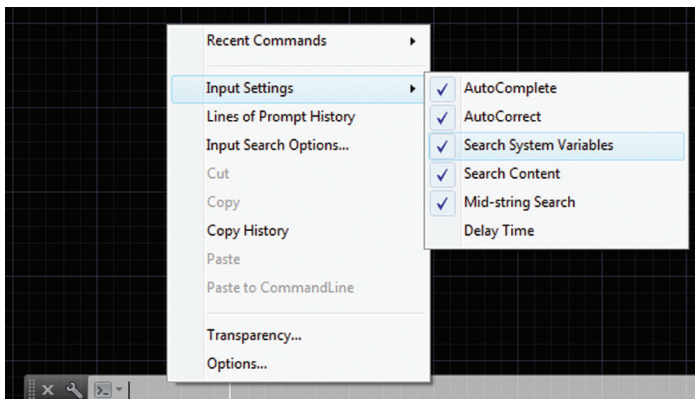


Figure 2: The Command Line has many new auto complete options available.

Xref linetypes are no longer displayed in the linetype list or in the Properties palette. Before, they were displayed in these lists, but you could not assign them to the object. They just got in the way. Xref attachment type is easily toggled between Attach and Overlay by double-clicking the type in the xref manager and selecting the style you want to use, even after it has been set. You can also switch between Absolute and Relative path. You can also remove the path completely—the -XREF command has a new PATHWAY option available to facilitate these changes easily through scripting.

THE CLOUD

Several new features in AutoCAD 2014 get their power from the cloud. You will have to be logged into your Autodesk 360 account to use many of these new tools. One feature is to sync your settings. Save your settings to your account and download them to any machine on which you are logged into your account. This also enables command line Internet search, Autodesk Live Maps (we will look at those later), Design Feed (the best feature in this update), and exchange apps. The Online ribbon tab has been renamed to Autodesk 360 to better match the branding of Autodesk's cloud features. This ribbon tab includes the new Open Folder tool that allows easy access to your Autodesk 360 folder on your workstation. It also provides easy access to the new Design Feed tool. The Autodesk 360 ribbon tab also includes tools uploading images for a drawing that you can share online through Design Feed.

DESIGN FEED

In my opinion, this is the best new feature added to AutoCAD 2014. Design Feed, introduced to us in AutoCAD WS, enables users to communicate through a drawing by adding notes and images for discussions. You must be logged into your Autodesk 360 account to use this feature. When in use, it will display a palette where you can share messages and images with colleagues, clients, or consultants through Autodesk 360. Posts appear with related drawings on a desktop, on the Internet, and on mobile devices. These messages and images can be associated with a location in the drawing or just generally relate to the file. There are tools that

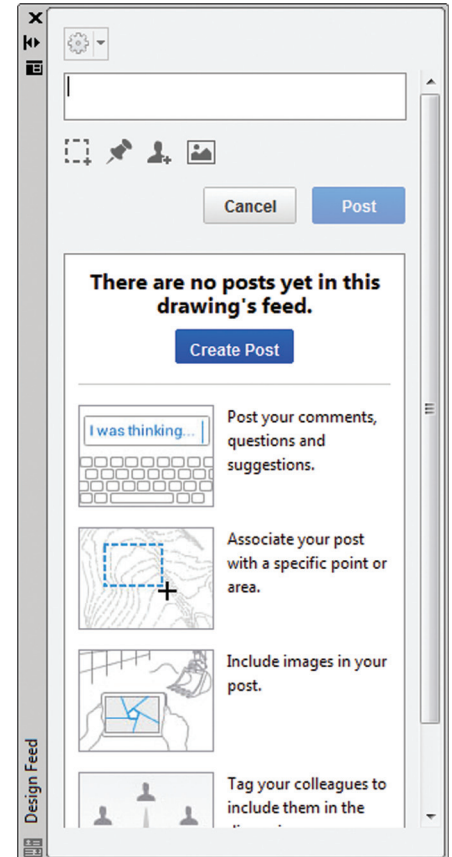


Figure 3: Design Feed provides a means for communicating with others about a specific file.

AutoCAD 2014

allow users to tag colleagues, clients, or consultants in order to notify them of the post. These notifications are delivered via email and also appear within AutoCAD. Once the post is completed and saved to Autodesk 360, authorized users can view the drawing and associated posts. The people who have been tagged can post replies. When a post, along with its replies, are no longer active, users can resolve the thread to hide it in the Design feed palette.

GEOGRAPHIC LOCATION

Another new feature are the Geographic Location tools. These tools allow you to find the location of your project and project a map into your drawing. This can help design your site-based project according to its geographic surroundings. These maps will not print and are intended to aid in design only. For some, this will make the new feature useless or at least not good enough to bother with. But others may find it can help to quickly verify geographic features for their project. You must be logged into your Autodesk 360 account to take advantage of this new cloud-based tool. You set your location using the Set Location tool in the Insert ribbon tab. You can set it using the new Autodesk Maps Service or you can opt to set it using a KML or KMZ file. When using Autodesk Maps to determine your location, you can search for an address, latitude/longitude, or zoom and pan across the map.

When a map is displayed in your file it will always be set below your drawing geometry. You won't have to keep messing with draw order to keep it underneath anything. If you are working on a GPS-enabled workstation or laptop, use the Locate Me tool to determine your current location. This is a great feature when working on the job site.

EXCHANGE APPS

AutoCAD 2014 has direct access to Autodesk Exchange Apps. Get there by going to the Featured Apps ribbon. This ribbon tab also includes a selection of featured apps that are available for download. The Plug-Ins ribbon tab gives access to the Exchange App Manager and the Import SKP file tools. The Exchange App Manager makes it easy to view and update installed apps. Double-click on an app to choose the Help option (from a right-click menu) to learn more about it. You can also uninstall or rate the app here as well. Keep in mind that any apps you purchase are associated to your Autodesk Exchange account.

POINT CLOUD SUPPORT

AutoCAD 2014 comes with a new tool, Reality Capture, which runs outside of AutoCAD, similar to Reference Manager. This tool takes raw 3D laser scan data of any object or project and processes it into point-cloud data that is more easily read by AutoCAD. This enables users to take a large amount of point cloud data and put it in a more manageable format. Autodesk ReCap will convert the data into RCP files that reference RCS files. Recap supports many popular formats including Faro, Leica, and Lidar.

AutoCAD can now support RCP and RCS files in addition to the previously supported PCG and ISD formats. Once a point cloud is attached, the Contextual tab displayed has more features than were previously available. Stylization controls (colors) are now available, making the displayed data match the scanned colors of the actual object. This will assist in visualizing the scanned object. There are also settings for displaying the colors

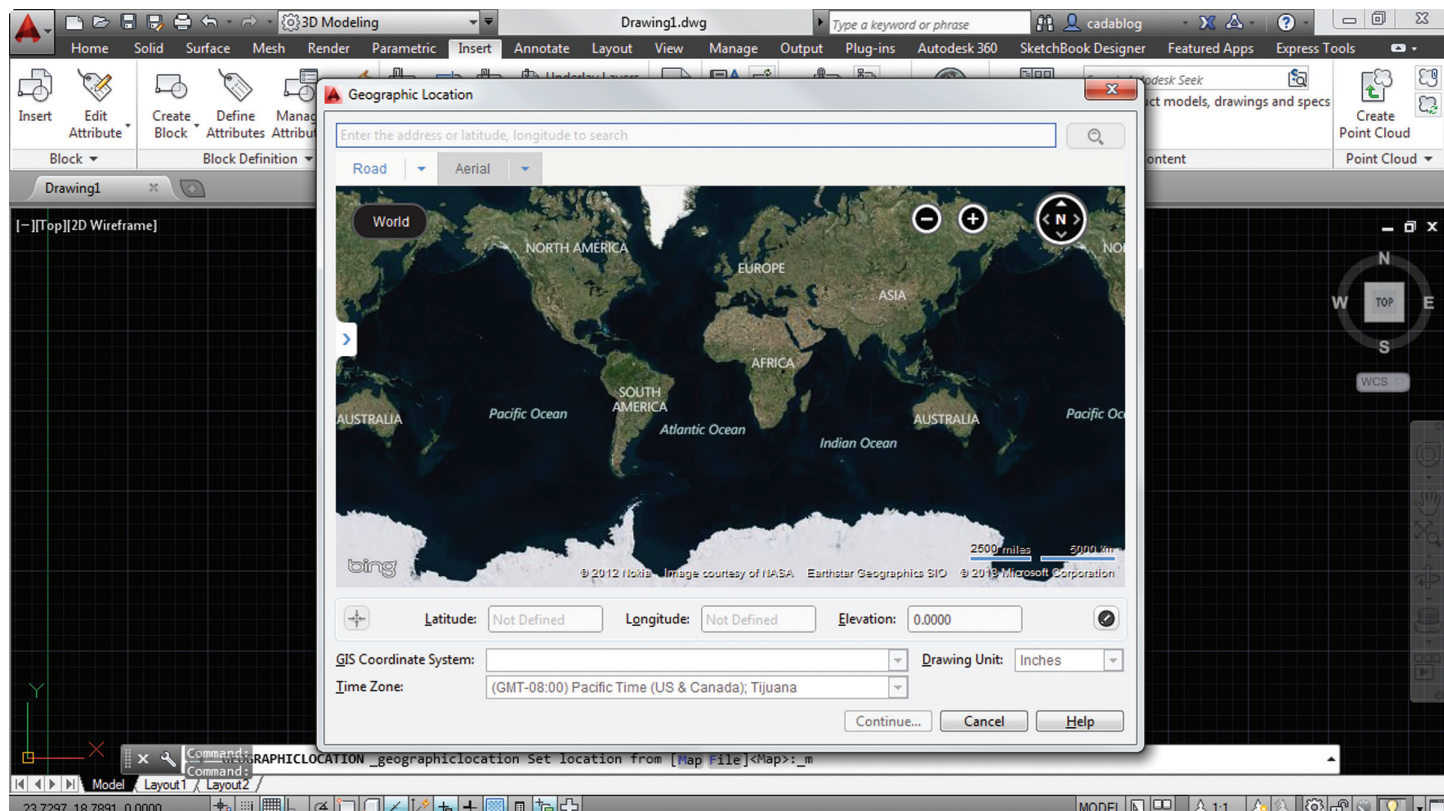
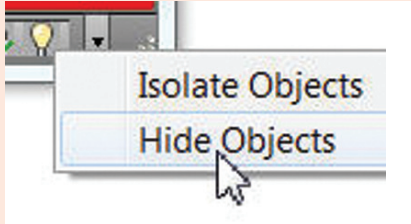


Figure 4: Geographic Location uses Autodesk Maps Service with maps provided by Microsoft Maps.

And Here's How... To Hide and Isolate Work

You need to plot Phase I, but you don't want to see the Phase II components. You could have put the Phase I stuff on its own layer, but it's too late and you need to turn it off now.



Ah, that's where we need a review. Every fiber of our AutoCAD being says if you can't see it, it has to do with layers. Nowadays, you can just Hide the objects. Please note, this has nothing to do with the HIDE command for hiding 3D objects.

MEMO: We have had Isolate Layers for years, but that would either turn Off or Fade/Lock layer content.

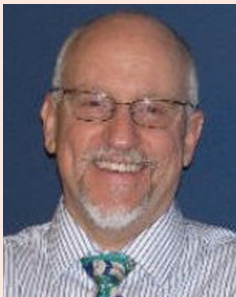
NEED TO KNOW

- Click the yellow light bulb in the bottom right corner before or after you select the objects, then click Hide Objects.
- You can select the objects first, then right-click and go to the Isolate shortcut menu.
- Hide Objects = The selected objects are hidden.
- Isolate Objects = Everything is hidden except the selected objects.
- If there are hidden objects in the drawing, there will be a red light bulb in the lower right corner.
- You can Hide multiple times within a drawing, but End Object Isolation (red light bulb) reveals all hidden objects.

OBJECTISOLATIONMODE

- The Isolation/Hide condition of the objects is temporary. Close the drawing, open it again, and they're all back.
- The Isolation/Hide conditions of the selected objects is retained as the drawing is opened and closed, until you end the object isolation.

Disclaimer: No Layers were harmed during the presentation of this review. Any resemblance to layer-related procedures is purely intentional ... but, curiously, had nothing to do with layers.



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of the objects to a Normal setting (colors based on the normal direction of point) and a setting for Intensity (sets the reflectivity value of points). If normal or intensity data was not captured, these options will be "grayed out" and unavailable. There are also more clipping tools in the ribbon, similar to the clipping tools in an xref drawing. This reduces strain on computer systems in that there will be less data to have to deal with. Auto update is turned OFF by default, making panning and rotating of the

views smoother—the computer will not try to render the screen every time the view changes.

TOUCH SCREEN

AutoCAD 2014 has Windows 8 touch screen support. If you are using a Windows 8 touch screen device, you can benefit from smoother zoom and pan performance. There is a new control feature on the System tab of the Options dialog box that displays

AutoCAD 2014

a touch ribbon panel when a touch screen device is detected. This ribbon panel lets users cancel the current command and returns them to the Select/Command prompt. I tried this out on my touch screen running Windows 8 and I rarely needed it as the transition between panning and selecting was rather intuitive and smooth. But I did need it from time to time and it was very useful.

SECURE LOAD

AutoCAD 2014 provides a new feature meant to help keep users more secure, called Secure Load. It is intended to help prevent the loading and running of unauthorized or malicious AutoLISP and VBA applications. Go to the Files tab on the Options dialog box and find the Trusted File Search Path. You

drawing to either a named or color-dependent plot style. It now supports spaces in style names. This is a very small thing, but one that might help when naming styles. The default behavior for inserting blocks with attributes displays the dialog box. ATTDIA is set to 1. Single line text is changed to maintain the last justification setting until it is changed. The new DIMCONTINUEMODE system variable gives you more control when making continued and baseline dimensions. When DIMCONTINUE is set to 0, the DOMCONTINUE and DIMBASELINE commands make dimensions based on the current dimension style. When set to 1, they apply the style used in the selected dimension being continued. The Ribbon Hatch tool will maintain the previously used method of selecting a hatch, either Pick Internal Point or Select Objects. The undo option has been added to the command line.

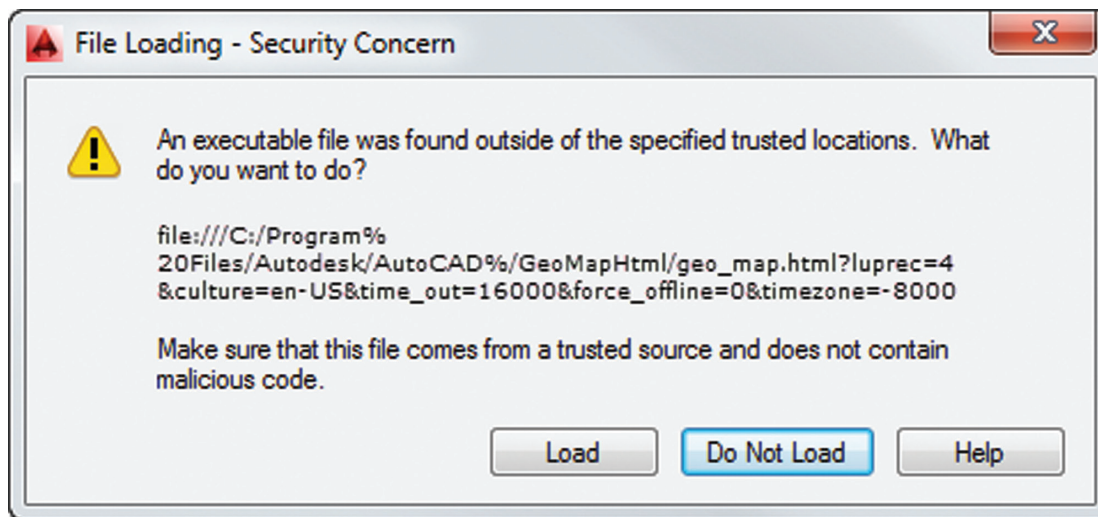


Figure 5: Secure Load can prompt users when executable files are being loaded.

can also access these controls by using the TRUSTEDPATHS and TRUSTEDDOMAINS system variables. A Security control area of the System tab in the Options dialog box provides access to the new Executable File Settings. Here you can allow executable files to be loaded from all search paths or only from locations specified by the Files tab. You can also choose to display warnings before loading executable files outside the trusted locations. These options are applied to the new SECURELOAD system variable. When creating a network deployment, these options can be set ahead of time in your deployment.

THE LITTLE THINGS

A new AutoCAD means that there are several “little” enhancements that have taken place. These are small changes to make existing tools better. You can now draw arcs in either direction by pressing the CTRL key to switch directions. The AUGI Wish List request for the ability to fillet a polyline on itself has been granted. Why wasn’t this in there to begin with? When you create a new sheet using the sheet set manager, the CreateDate field stored in the associated template file (.DWT) displays the creation date of the new sheet now instead of the creation date of the .DWT file. The CONVERTPSTLYES command lets users convert the current

CONCLUSION

In this article we took a closer look at the new features than we normally do because this release had a shorter list of improvements than in past updates. What do you think of this release’s features? Was it enough? Should more have been added? It was nice to see AUGI Wish List items marked off. Is this release worth an update? Should you wait for the “bugs” to be fixed? I’m excited to start using the Design Feed tool and I can’t wait to see how others use it. I’m worried the Secure Load features will get in the way

(I also predict many rants on the Internet about it). Regardless, you will always be able to come to the AUGI Forums for help and discussion on these new features and tools from Autodesk.



Brian Benton is a Senior Engineering Technician, CAD Service Provider, technical writer and blogger. He has over 19 years of experience in various design fields (Mechanical, Structural, Civil, Survey, Marine, Environmental) and is well versed in many design software packages (CAD, GIS, Graphics). He is Cadalyst Magazine’s Tip Patroller, AUGI HotNews Production Manager, and Infinite Skills AutoCAD training video author. Contact him at cad-a-blog.com



Inventor: Increasingly Social

In this year's new Autodesk Inventor® release, Autodesk focused on increased productivity in the Assembly environment, as well as some user-requested improvements scattered throughout the platform, along with the ever-increasing shadow of social networks and sharing, Autodesk has added features to help users help each other and to share their models through the Autodesk 360 service.

This article focuses on improvements in these areas:

INVENTOR

- ✦ User Interface
- ✦ Sketches
- ✦ Parts
- ✦ Assemblies
- ✦ Materials
- ✦ Drawings
- ✦ Interoperability

INVENTOR PROFESSIONAL

- ✦ Mold Tooling

COMMUNICATION

- ✦ Autodesk 360
- ✦ Grapevine
- ✦ Inventor IdeaStation
- ✦ TeamWeb

OTHER ENHANCEMENTS

USER INTERFACE

BASIC SKILLS INTERACTIVE TUTORIALS

Basic Skills Interactive Tutorials are available to assist users in creating their own 3D objects in Inventor.

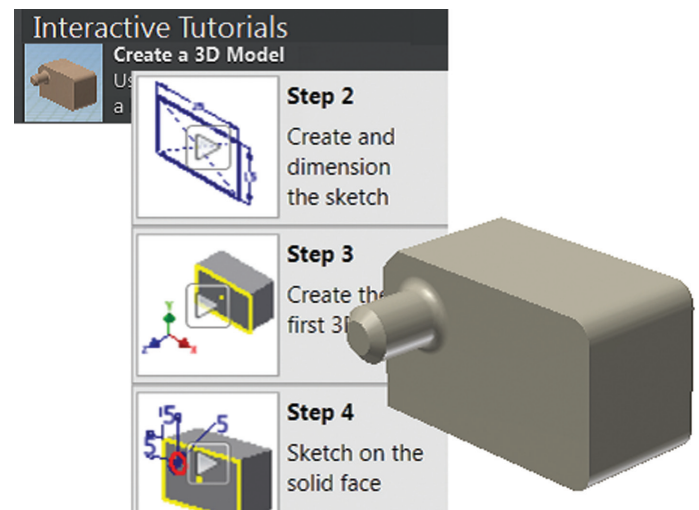


Figure 1: Interactive tutorials

- ✦ Connect Interactive tutorial – interactive introduction to the Connect Command.
- ✦ New location for Interactive Tutorial files – permits unrestricted access to allow users to add their own. The new default path is:

Inventor 2014

- Drive:\Users\Public\Documents\Autodesk\Inventor 2014\Interactive Tutorial\en-US\.
- Interactive Tutorial visual enhancements – new size, shape, and color of ribbon command pointer and video play button.

CREATE INTERACTIVE TUTORIALS

Instructions and sample files for use in creating your own interactive tutorials are in a separate download provided by Autodesk here (including sample files):

http://www.autodesk.com/interactive_tutorial-2014-64bit

http://www.autodesk.com/interactive_tutorial-2014-32bit

SKETCHES

LINEAR AND ARCHED SLOTS

New tools allow sketched slot profile geometry to be created along centerline using the following options:

- Center to Center Slot – centerline orientation, length, and a width parameter.
- Overall Slot – overall length, orientation, and width parameter.
- Center Point Slot – Mid point to end of centerline, orientation, and width parameter.
- 3-Point Arc Slot – 3-point arc and width parameter.
- Center point Arc Slot – radius point, start, angle, and width parameter.

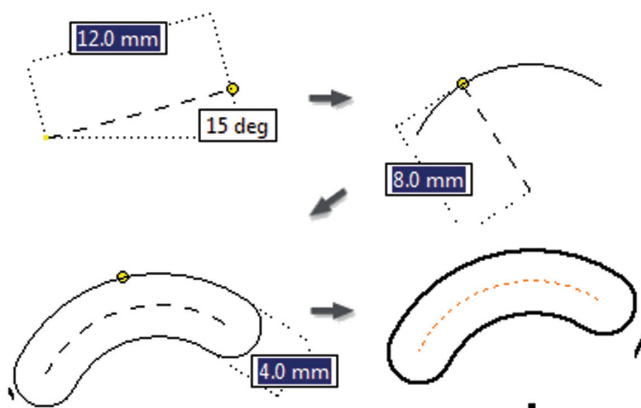


Figure 2: 3-Point Arc Slot

PARTS

- Create a work point at the center of a sphere.
- Color overrides in derived components can be discarded and those override settings are now persistent.

SELF-INTERSECTING SWEEPS

This has been an issue for a long time. Inventor doesn't warn users that a problem exists until after the command is issued, nor does it specifically assist you in determining the resolution. Autodesk Inventor 2014 provides users with an enhanced sweep command, which allows large profiles to be swept along small fillets and bends. Where radii overlap in tight corners, the obvious intersection is retained.

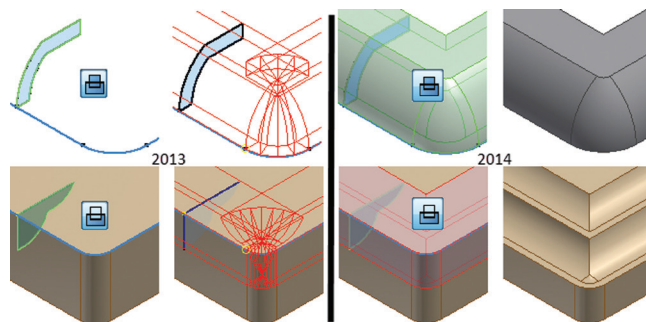


Figure 3: New Sweep solutions

Note: This functionality only applies to solids at this time.

NON-TANGENT SURFACE SWEEP PATHS

New sweep capability permits creation of swept surfaces along paths where the geometry is non-tangent.

ENHANCED BOUNDARY PATCH

Two options have been added:

- Automatic edge chain – provides streamlined workflow when selecting multiple edges, and includes non-tangent geometry.
- Boundary patch – create complex shapes using weight factors for smooth and tangent boundary patch types.

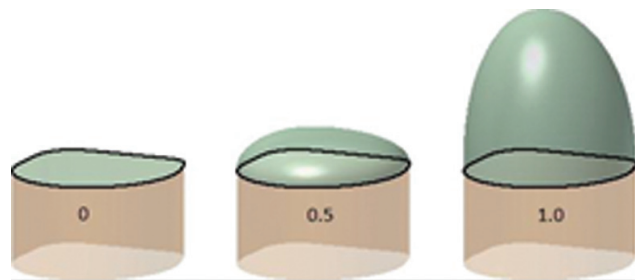


Figure 4: New Boundary Patch functionality

FILLET SUCCESS DIALOG

This is a nice addition. When a fillet fails to be developed in a selection of numerous edges, the possible solutions are previewed. Once the successful portion of the operation is completed, a dialog is displayed showing:

- unsuccessful features count
- total count of selected edges
- option to accept the successful features

Once accepted, a repeat operation will include the original radius size and selection in an attempt to add remaining features to the updated model shape.

ASSEMBLY

- Export of driven constraints improved by optimizing the WMV and AVI export for optimal quality (default).
- Appearance property available in Bill of Materials and Parts List.

JOINTS

This is probably the crown jewel of the release. A new command called Joint provides a one-step method for positioning components and defining their motion. The selected geometry determines the joint type by default, which can easily be overridden by the user.

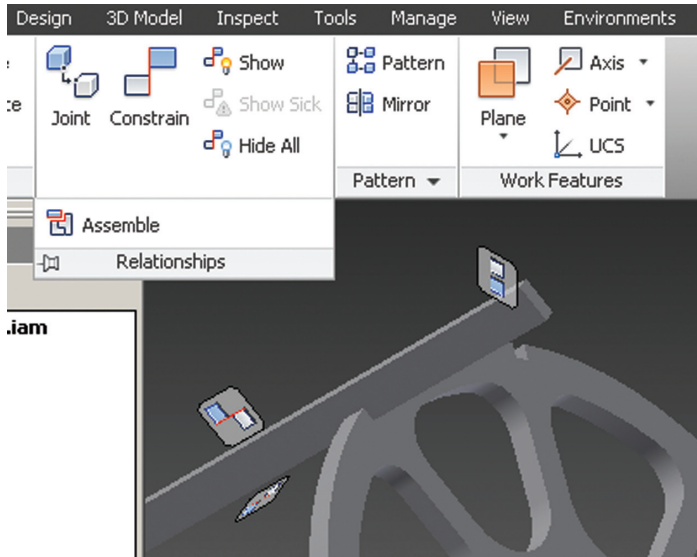







Figure 5: Relationships (note that the Assemble tool remains)

With the addition of this tool, constraints and joints are now referred to as relationships, and are grouped together in the ribbon on a panel named accordingly. The constraints folder is renamed to "Relationships" and appears in both the Assembly and Modeling views.

These are similar to the joints in Simulation, which I like as it reduces the difference between the modeling and simulation environments. Some conversion of names between the two still has to be made when entering the Simulation environment.

The joints are defined as follows:

-  Rigid – Removes all degrees of freedom (DOF)
-  Rotational – one rotational DOF
-  Slider – one translational DOF
-  Cylindrical – one translational and one rotational DOF
-  Planar – two translational and one rotational DOF
-  Ball – three rotational DOF

Note: You can use joints with constraints to position and describe motion.

SIMULATION JOINT CONVERSION TYPES

Created joints are automatically converted to joints when you enter

the Dynamic Simulation environment. The converted joints are listed as standard joints in the Simulation Environment browser. The following are the automatic conversions:

Inventor Joint	Joint in Dynamic Simulation
Rigid	Welding
Rotational	Revolution
Slider	Prismatic
Cylindrical	Cylindrical
Planar	Planar
Ball	Spherical

Relationships can be further modified with two other options:

- + Lock – maintains the current position until a connected component position is changed.
- + Protect – alerts you if an added relationship violates the required DOF.

Note: Lock and Protect are not available for constraints.

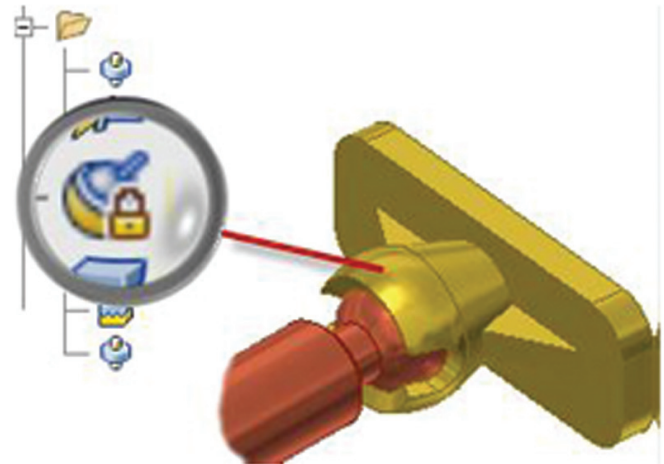


Figure 6: Locked ball joint

RELATIONSHIPS DISPLAY

Visual management of relationships is provided by glyphs that are attached to components.



Figure 7: Joint visibility icons

- + Show – when active, relationship glyphs appear when the component is selected. Further editing of the relationships is provided through the related contextual glyph menu.
- + Hide All – removes all relationship glyphs from the display.
- + Show Sick – displays the glyphs for all sick or damaged relationships.
- + Grounded glyph – 'Pin' appears when you mouse over a component.
- + Once shown, the display is persistent until the Hide All feature is reactivated.

Inventor 2014

PLACE COMPONENT

When placing the first component into an assembly it is no longer automatically grounded. This is provided through the Place command's context menu, which contains new options for rotation and placement. This option is deselected by default.

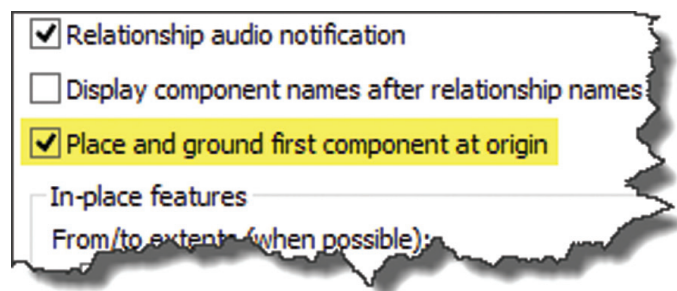


Figure 8: Place Component

One of the favored features is found by selecting multiple files from the Place Component dialog, allowing users to place all of those components at their grounded origins in one shot. Many users will also love the ability to rotate the parts about the origin axis on placement.

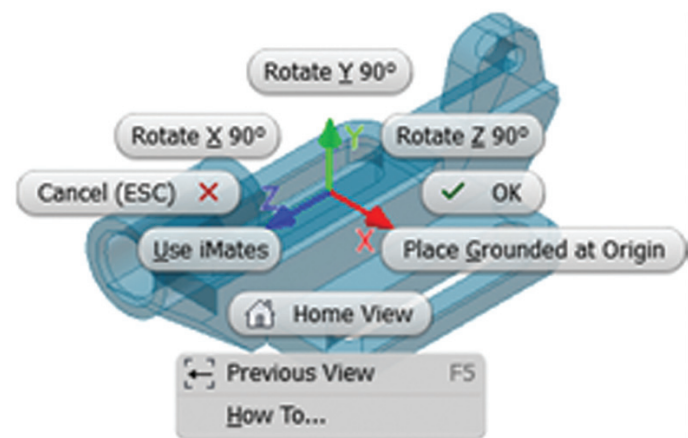


Figure 9: New Place tool

Place Grounded at Origin feature works wonderfully.

FREE MOVE / ROTATE

Allows components to be dragged about the canvas, while relationships are "put on hold." A rubber band is added to show the component is in Free Move. The relationships are indicated with glyphs, which can be selected to easily see how and where they were applied, offering a context menu in which to edit the constraints as needed.

Free Move is a temporal state. Once activated, the components are free to be moved about until an update is performed, whereby the component relationships will be reinforced. Free Rotate functions in a similar manner.

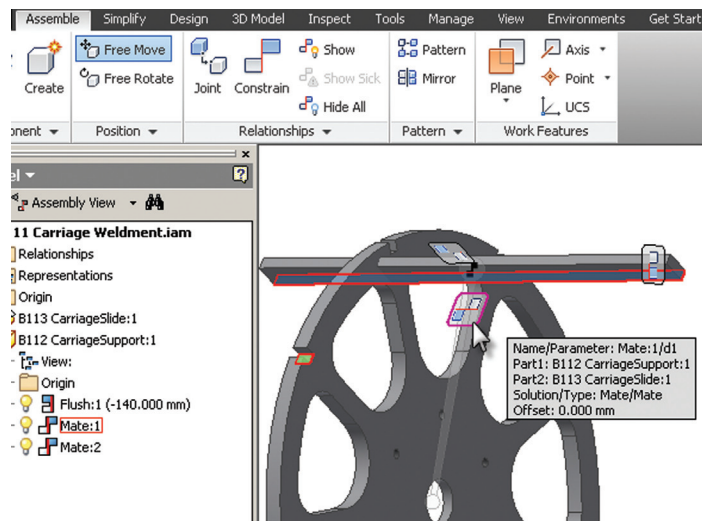


Figure 10: Free Move tool

ASSEMBLY COPY AND PASTE

Enhancements allow the assembly to be copied with the joints and orientation intact.

SYMMETRY CONSTRAINT

An option in the Plane Constraint dialog; allows two objects to remain symmetrically placed in relation to a plane or planar face.

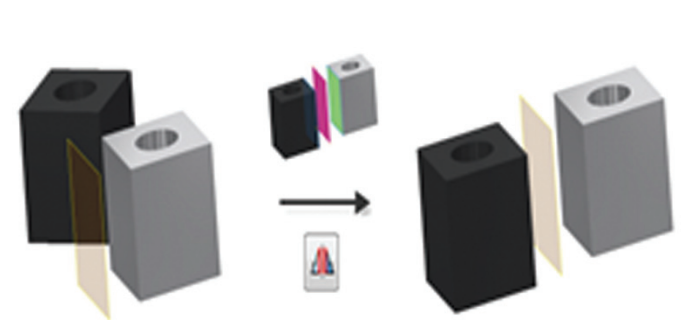


Figure 11: Symmetry Constraint

ANGULAR CONSTRAINT IMPROVEMENT

Improvements include Status Bar instructions, visual cues of direction and angle in Graphics window, and an updated model preview.

EXPRESS MODE

Large assemblies typically open 4-6X faster. When enabled, assemblies are loaded in Express Mode when the unique files threshold has been exceeded. Some commands are not present until the assembly load is completed.

Note: Part data is stored in the assembly file in this mode, enlarging the file significantly. Keep this in mind.

IMPROVED GRAPHICS PERFORMANCE

Pan, Zoom, and Rotate of large assemblies has been enhanced in both Full and Express modes by:

- Increased frame rate from 10Hz to 20Hz

- Largest component is drawn first
- Multi-core support

A New Consolidation Background operation draws objects with the same appearance as a single group, improving GPU performance.

INSERT FRAME COMMAND ENHANCEMENT

This option in the Insert dialog allows construction and center line types to be excluded/included in the frame geometry selection.

CAMERA SETTING IN VIEW REPRESENTATIONS

Context menu options are now available to Save Current Camera, Restore Saved Camera, and AutoSave.

MATERIALS

MATERIALS BROWSER

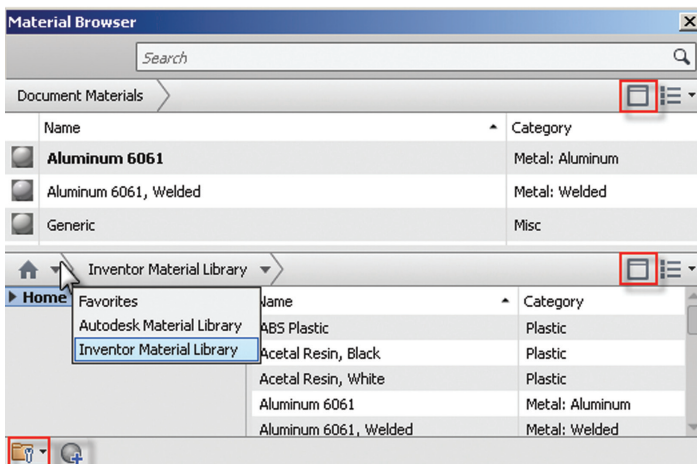


Figure 12: Materials Browser enhancements

Additions to the Materials Browser include:

- Show/Hide Library panel and tree icon – greater control over your view.
- Home Button – control display of saved libraries.
- Library Folder icon – provides more access to Library operations.
- Tabbed Interface in Materials Editor.

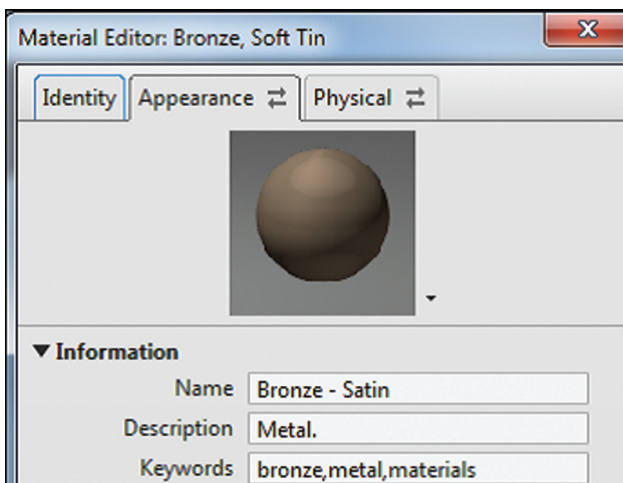


Figure 13: New Tabbed Material Editor

- Multi-select materials and appearances to add to a library.
- Lock and refresh icon – shows when shared libraries are being edited (locked) or need to be refreshed (out of date).
- Visual Aids – italic and underline text indicate differences between the document materials and appearances and library. These improvements are related to those in the Inventor 2013 service pack 1.1.
- Lots of behind-the-scenes changes to improve performance and usability.

DRAWINGS

- Appearance property can be added to BOM and parts lists.

SPLIT TABLES

Now various tables such as parts lists, holes, revisions, and general tables can be split into multiple segments, retaining the common header for each. Split/Unsplit Table options are now present in the table's context menu, which splits the table into two parts. The new split segment table is displayed as a child relationship to the original parent table in the Drawing browser. Changes to the parent propagate to the children, but not vice-versa.



Figure 14: Split Tables

RASTER VIEWS

A new option in the drawing view dialog creates raster views that do not evolve into precise views until user specified. This allows immediate update to views that contain large assemblies without the delay of a full recompute. Traditional green brackets surround the drawing view, and a red diagonal is present for the view in the Drawing browser.

A context menu permits individual views to be made precise, as well as a Graphics View menu that now contains the Make All Views Precise/Raster option.

INTEROPERABILITY

BIM SIMPLIFY

Where complete component definitions are not required for transfer, intellectual properties can be removed and simplified product representations can be created with Simplify tools. This feature can also produce Revit Family files with native form features.

Inventor 2014

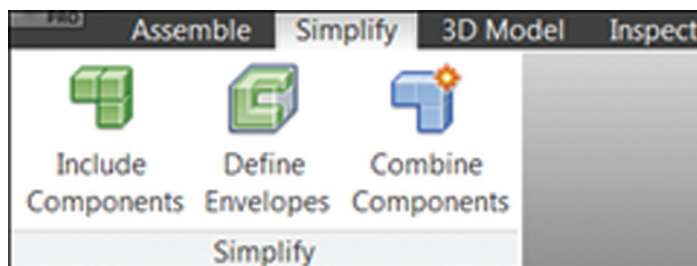


Figure 15: Simplify tab

The following options are available:

- Include Components – create view representation with selected components.
- Define Envelopes – box or cylinder envelope representation of selected features.
- Create Simplified Part – Uses current view representation to exclude hidden components.

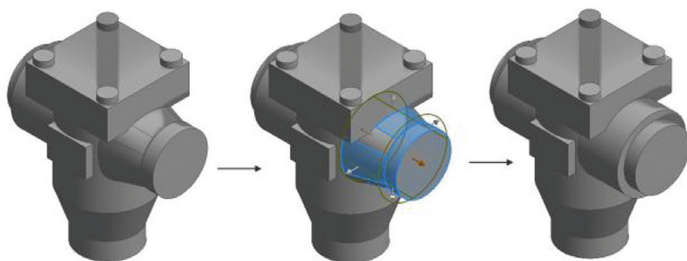


Figure 16: Define Envelopes tool

REVIT FEATURE RECOGNITION

This set of tools uses geometry simplification tools that allow users to represent the model with features Revit will recognize.

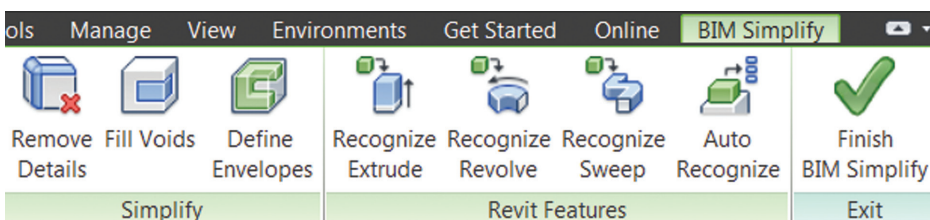


Figure 17: BIM Simplify and Recognition tools

- Remove Details – recognized fillets and chamfers are removed along with user selected faces.
- Fill Voids – cap off holes and pockets with surface patches resulting in solid fills.
- Define envelopes – simplify a component with box/cylinder envelopes of selected features.
- Recognize extrude – converted to Revit feature.
- Recognize revolve – converted to Revit feature.
- Recognize sweep – converted to Revit feature.
- Auto recognize – automatically recognizes extrude and revolve features, and removes fillets and chamfers.

BIM EXCHANGE

Parts can be exported to a native Revit Family file using the Export Building Component in the BIM Exchange environment. Connector, property, parameter, orientation, category, and insertion point information can be added.

CHECK REVIT FEATURES

Displays HTML report with model information contained in the Revit Family file feature translation rules. This is used to determine the success of the Revit Family file translation, including the status of each feature and reasons for unsuccessful translations.

TRANSLATORS

Additional model translation support has been added.

Export:

- Parasolid version 9.0 through 25.0
- Pro/ENGINEER Granite version 1 through 8.0
- CATIA V5 version R10 through V5-6R2012

Import:

- CATIA V5 version R6 through V5-6R2012
- NX version Unigraphics 13 through NX 8.0
- SolidWorks version 2001 plus through 2012
- Up to Wildfire 5.0, Creo Parametric version 1.0 through 2.0

REVIT INTEROPERABILITY SUB-COMPONENT

- Import a .rvt (Revit project) file in Place Components dialog.
- Export .rfa (Revit Family) file in the Export Building Components dialog.

Note: There is an option to install this functionality that is not present by default.

MOLD TOOLING

EXTEND RUNOFF SURFACE COMMAND

Rule and component tangent-based solution allows direction of the developed runoff surface.

AUTODESK 360

A new Launch Website command is present in the Online Documents panel of the ribbon, giving access to the user's managed files on Autodesk 360.

- Autodesk 360 files can be opened and saved through File/Place/Create Component dialogs.
- Autodesk 360 notification icon – installed in the taskbar notification area, allowing mouse-over status updates.

DEPENDENT FILE TRACKING

Assembly and related part dependency tracking is now fully supported through Autodesk 360, so all related parts are automatically sent to the cloud when the parent assembly is saved there.

DRAG AND DROP TO WINDOWS EXPLORER

A new Autodesk 360 Drive feature is placed in Windows Explorer,

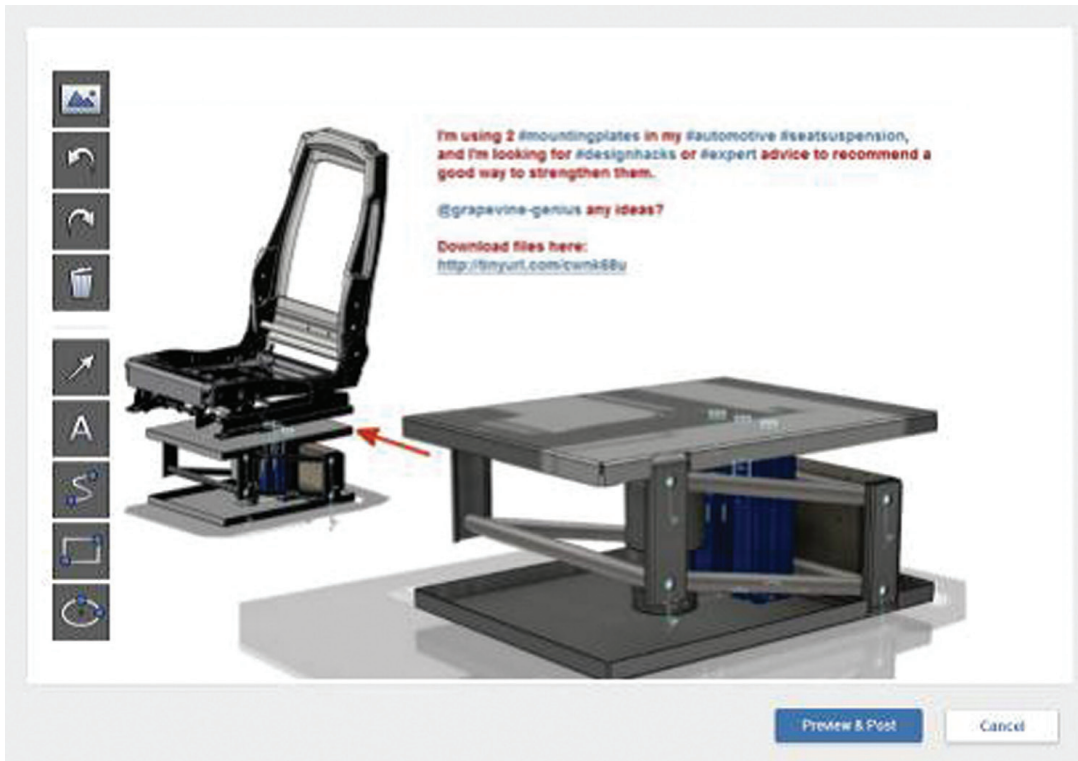


Figure 18: Grapevine commenting

allowing users to drag and drop files that sync to their account. All reference files are synced automatically.

GRAPEVINE

A new online problem-solving community has been developed to allow Inventor users to ask questions in a comfortable community environment. Easy-to-use visual tools such as screenshots can be annotated and attached to the question post.

The Grapevine is accessed through the Help panel, and users are notified when their responses are available. The Grapevine is intended to allow social interaction and encourage participation.

AUTODESK INVENTOR IDEASTATION

Autodesk has developed a forum to allow users to share their ideas directly with the developers. Features include tracking of users' ideas, peer comments, and "kudos." The more kudos an idea receives, the better the likelihood that feature will be turned into a reality. Idea statuses change and can be tracked from post to release implementation.

TEAM WEB (CAD ADMINISTRATION TOOLS)

Team Web allows a company to employ an intranet portal for customized company help, which might include regularly updated standards, easy lookup tables, and various resources. The Team Web command launches the site and is configurable in the Inventor Application Options. Team members can access the site through the Help Menu -> Team Web. This functionality is not new, but is being refreshed along with the numerous social tools.

OTHER IMPROVEMENTS

UPDATE DESIGN/ MIGRATION IN TASK MANAGER

The Task Scheduler now includes options for both the Update Design and Migration tasks, where you may control the inclusion of assembly graphics for Express Mode. This option is turned off by default.

- Export errors from Task Scheduler log file to Excel.

DEPLOY ADDITIONAL SOFTWARE

Users can include add-ins, components, and other applications when creating a deployment. This can be accessed through the landing page of Inventor.

- Autodesk Exchange Control – Block access to Autodesk Exchange through the deployment.

POINT CLOUD ENHANCEMENTS

Autodesk ReCap, a separate installed application, indexes Point Cloud scan files and creates .rcs and .rcp (Reality Capture Scan and Project) files that can be imported into Inventor. Multiple scan files can be collected into a project and then attached as a group in Inventor.

- New Insert at origin setting permits users to insert the Point Cloud at 0,0,0.



John Evans is an Autodesk Certified Inventor Professional living in the Florida Panhandle, where he provides technical troubleshooting at Gustin, Cothorn, 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@johnnevansdesign.net



Predictions of a Present Future

At the time these “sacred texts” were penned for this issue, the release date of Revit 2014 was fast approaching. Marcello Sgambelluri and I thought it would be fun to call on “Revitdamus” to peer into the future and give our...uh ... *his* synopsis of What’s New in Revit 2014. Though space is limited in this article and we can highlight but a few, the newest offerings in Revit 2014 from The Factory are sure to open vast, uncharted frontiers within the galaxy that is BIM, in the cosmos of AECO. – Jay B. Zallan

PART 1

Jay B. Zallan

THERE WILL BECOME A GREAT TOGETHERNESS THROUGH A DRAGGING & DROPPING OF PANES AND GREAT SPACE WILL OPEN ANEW

Framework Feature | Dockable Window Enhancements

A picture is worth 1,000 words, so ponder the tabs at the bottom of the window shown in Figure 1.

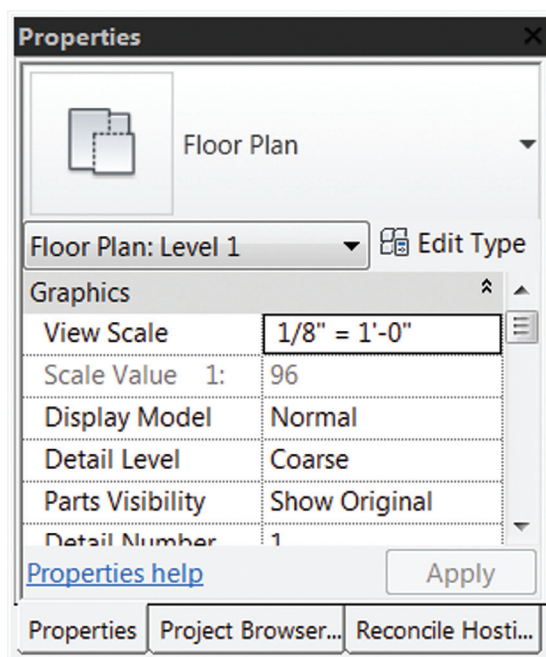


Figure 1

Yes—dockable windows! That Revitdamus is really accurate. Now we will be able to combine the following windows—called panes when docked together—into one window. Those available to dock are the:

- Project browser
- Properties palette
- System browser
- Reconcile hosting browser
- Rebar shape browser

Simply heed what Revitdamus says and drag & drop any number of these windows onto one another, just like docking, except on top of one another. Voila... no more windows, now they are panes in a larger window context—until you drag one away. Then it will become a window again, to float freely or dock elsewhere.

MODIFY VIEWS WITHOUT MODIFYING THEM | REMOVE EXCESS BY ADDING ACCESS

Platform Feature | Temporary View Properties

Change the View Properties temporarily without affecting the saved view state. Wait, did I get that right? Yes!

First thing with this new functionality mode, it looks as though the “Working” or “User” Views concept—though not the primary reason for this new functionality—is going away. Going away in many cases and, at the very least, it will take leave from my process immediately. No matter how much I embraced and championed the “User” view concept, I think it might be time to explore moving on from that excess of seemingly unnecessary views (for the most part).

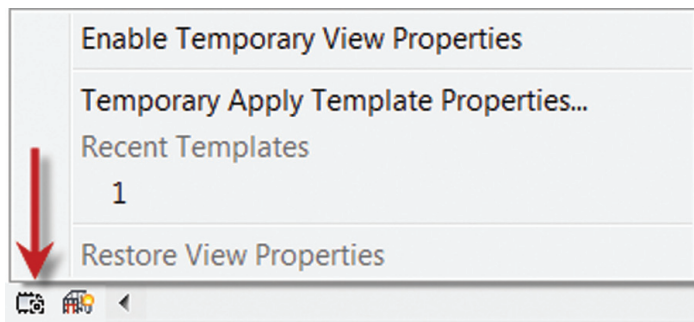


Figure 2: Temporary View Properties

With the Temporary View Properties mode enabled, one can change the view as needed to meet current and shifting workflows, whether by Visibility Graphic (VV) Overrides (on the fly) or by creating View Templates (VT) (on the fly or beforehand) and applying them temporarily. All this while preserving the printed look if that view is on a sheet, and why wouldn't it be now? Additionally, this workflow will not create worksharing issues for others while another user is in the Temporary View Properties mode.

What else does this mean? One can create a View Template and either apply it temporarily OR persistently. The View Templates

for Temporary or Persistent application are one in the same, so while we will be able to get rid of the User/Working Views, we may get a new explosion of View Templates themselves. Not necessarily a bad thing, though.

While in this new Temporary View Properties mode, any (read as ANY) property associated with a view template can be modified, but will not be saved, as stated either by VV changes or applied VTs. When this mode is closed, all the modified properties will reset to the view's previous, saved state.

Although created initially from Structural requests, I can see this becoming a valuable tool in the tool shed that is efficiency. Furthermore, I see its reductive impact on file size being a great impact not only of view quantity, but also of sheer file size and workability. Removing the view overload that many a Reviteur currently battles is surely a gain.

As to the issues, in case you are interested here they are.

- Temporary View Properties replaces the prior “Temporarily Display Only Analytical Model Categories”
- Debug the Structural Analytical Model and the Connection

Status parameter can be isolated via a filter to easily change these objects in the view; for instance changing their color, thus allowing easy isolation and repair of the Structural model's ‘Unconnected’ nodes. Where will Architects take it? Oh, I have my ideas! What say you, MEP?

WHERE IT EXISTS | AS MEP HAS SO TOO YOU

Family Love | Room Calculation Points

The new Room Calculation Point has been added to all family types that are room aware.

- Furniture
- Doors
- Casework
- Specialty equipment
- Generic models

When these families are placed into a project, sometimes portions of their geometry are located outside a room, space, or within another element, which results in no calculable values being reported. Enabling the Room Calculation point allows the user to move the location of the calculation point to fall inside the required space. Note: these changes to the Room Calculation Point must be made in the family environment, but who knows? If we ask nicely, perhaps this new ‘object’ will become variable in the project environment.

VARIATION TO ONE REMAINS WITH THE ONE OR THE MANY | DESIRE GROWS SO TOO CHOICE

Parameter Enhancements | Values Can Vary by Group Instance

This one's pretty straightforward, some parameters need variants between Group Instances, even though all else remains coincident

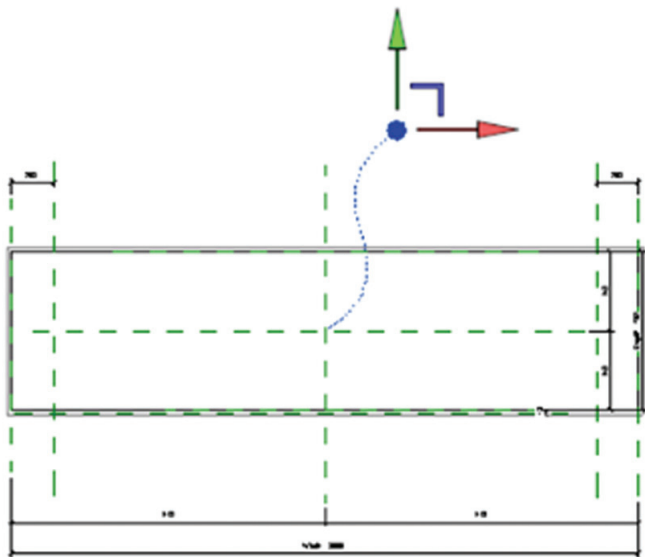


Figure 3

with the other Group Instances. These two choices give us the freedom to allow or disallow parameter changes to propagate through the other Group Instances, at our discretion.

Sometimes we get what we want, since at times that's what we need.

THE ANSWER TO "WHY NOT" WILL BECOME THE UNNECESSARY QUESTION "WHY HASN'T IT BEEN FOREVER ELEVATED AS SECTIONED?"

Feature Enhancement | Split Elevations

If you have ever created a jogged section, you will know of this tool—you just won't have known it to be used on Elevation Views, since for some inexplicable reason it wasn't developed as such. Until now!

Now what will this hold for the future? I am not sure, but if I can digress with a little fantasy I think you may just agree.

Maybe there is an upcoming functionality enhancement to make Elevation Views have graphics that respond to the distance from the Elevation itself. I have been calling for multiple 'levels' of depth perception inside of Revit Elevation and Section Views for as long as I have used. I can only hope that my idea be taken on within The Factory. Anyhow, the Split Segment tool is live in Elevations and that IS good news.

TOWARD A ZEN OF MATERIALITY

Materials UI | Material Editor Tabs, Usability, Editing

To enhance the usability of the Material Asset systems, a modified Material User Interface has been designed that utilizes tabs for each Asset, as well as streamlines the material editing process. This makes the workflow much smoother and perhaps even easier to learn by the ever-growing number of Reviteurs.

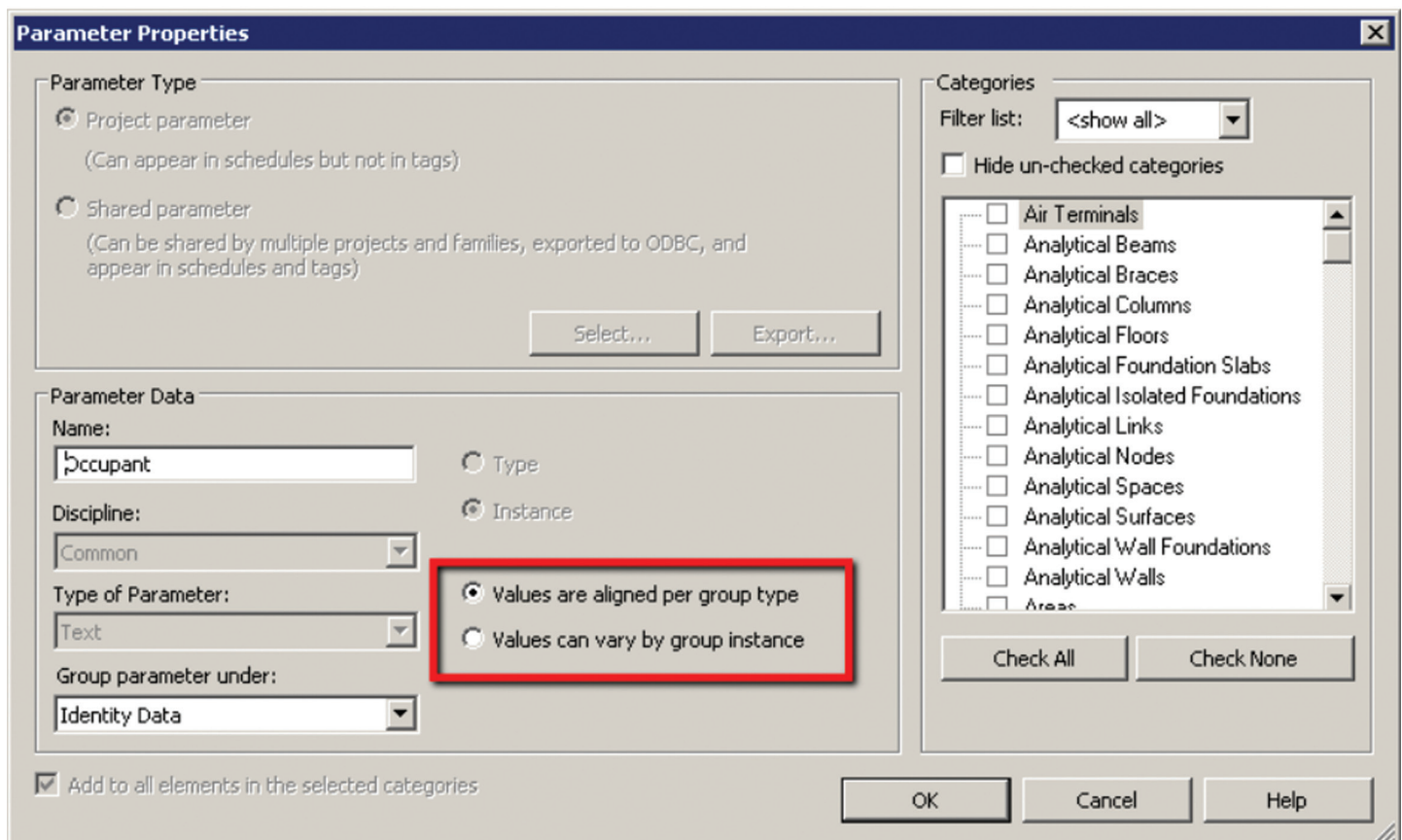


Figure 4: New Parameter Properties dialog

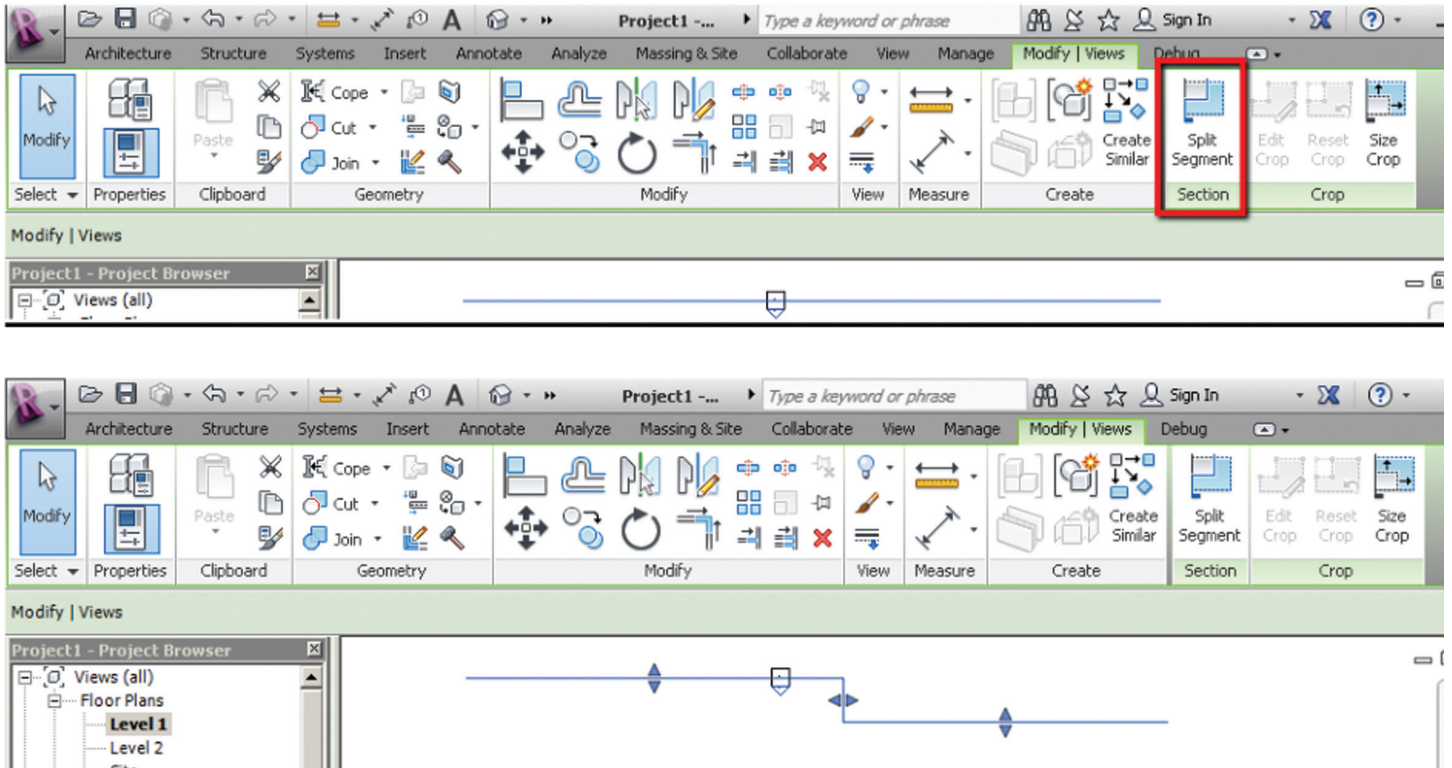


Figure 5: Split elevations

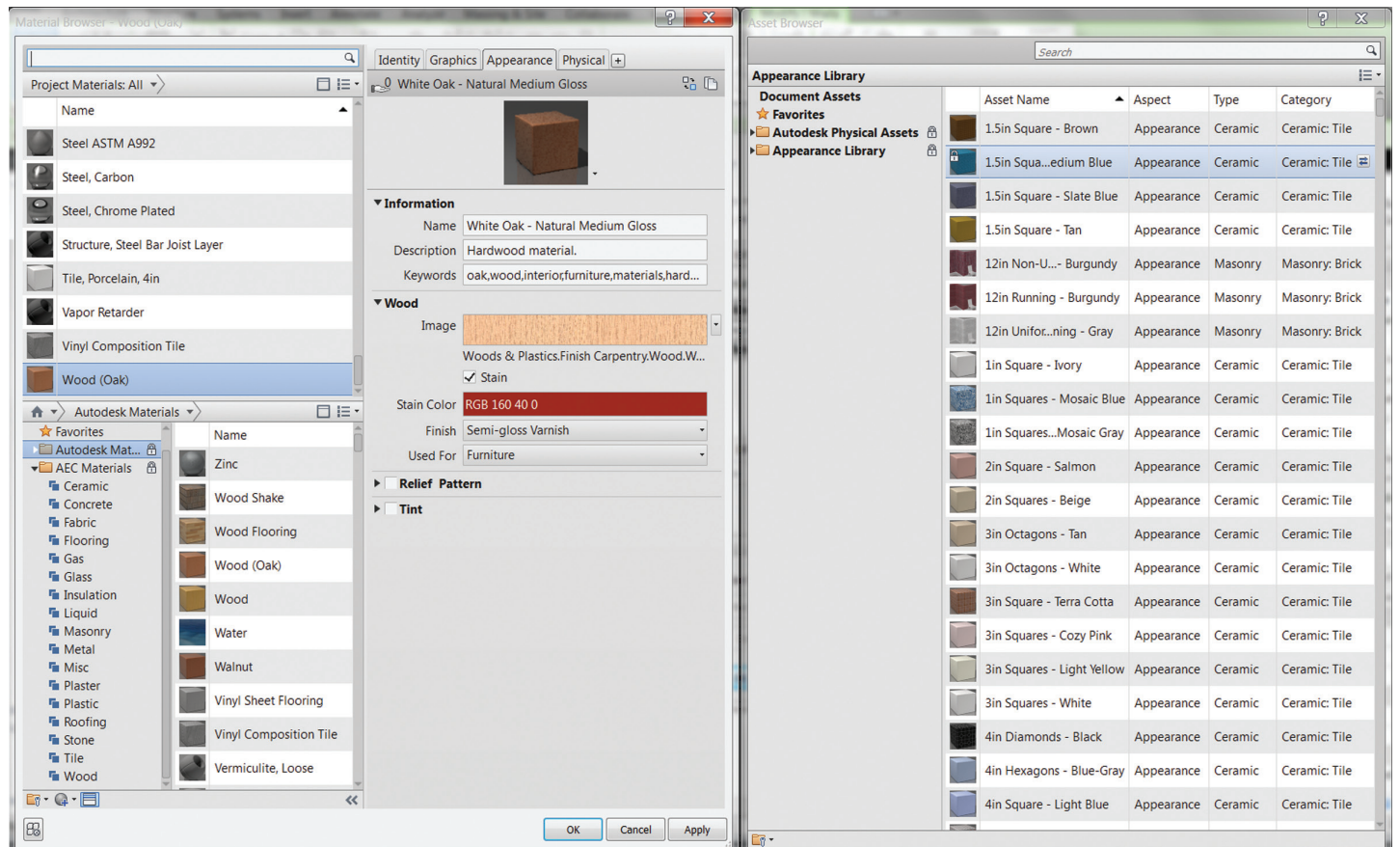


Figure 6: New Materials dialogs

Revit Architecture 2014

Note: There are far too many enhancements to the Material Environment—so many that they could be the subject of an entire article in themselves. Add to that all of other new and modified functionalities in Revit 2014, both mentioned and not mentioned in this article, and there simply is no room for proper depth of explanation herein. Therefore, look for my companion piece on <http://cad-vs-bim.blogspot.com/> under a title bearing an ominous similarity to the title of this article.

PART 2

Marcello Scambelluri

CROP REGIONS SHALL NOT BE LIMITED TO RECTANGLES IN THE YEAR OF '14

New Feature | Non-Rectangular crop regions

If you do not want a particular portion of the model to show up in your callout view, then simply use a non-rectangular crop region! Everyone has been waiting for this one for some time.

Now there is no need to use large masking regions to cover up elements in a plan view, etc., and (arguably) no need to hide elements in a cropped view.

This new feature is amazing and very simple to use. Follow the steps below to create one.

- In a plan view click View > Callout > Sketch and you will be placed in “sketch” mode.

- Use the draw tools and sketch the boundaries of the crop region.
- Click Finish.
- If you want to reset crop region, simply select it and click Reset Crop.
- See Figure A for some samples of non-rectangular crop regions.

THERE IS TO BE GREAT CONTROL OVER ELEMENT SELECTION

New Feature | Controlling the Selection of Elements

This new feature is similar to “freezing” layers in Autodesk 3ds Max® and others or defining elements as “not selectable.” Seems simple enough, but there is much more to it. The selection features are located below the modify tab, shown in Figure B.

By toggling “links, underlay, and pinned” elements off, it means that those types of elements will not be able to be selected by either clicking or by a selection window. By toggling select elements by “face” off, it means that you have to select the element by its edge, not its face. Finally by toggling the “drag elements” off, it means that you are not able to move an element by simply dragging it. All of these selection features have been added to ensure elements are not selected or moved accidentally.

Thank you, Revit!

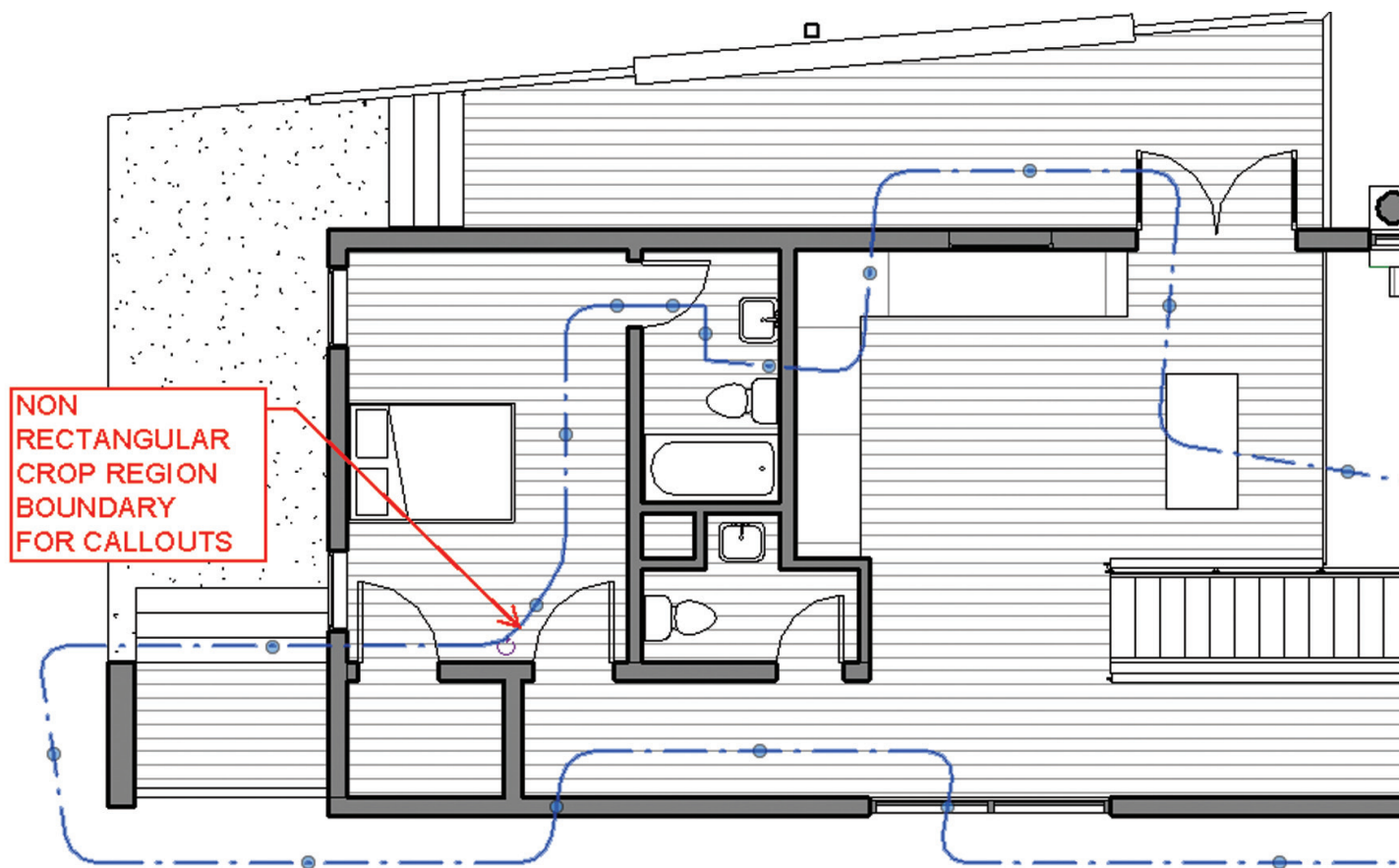


Figure A

RTC has expanded to Europe

Get yourself registered to one of the three events being held in 2013

AUSTRALASIA 2013

Langham Auckland,
 New Zealand
 16 – 18 May 2013

www.rtcevents.com.au/rtc2013au

NORTH AMERICA 2013

Westin Bayshore
 Vancouver, Canada
 11 – 13 July 2013

www.rtcevents.com.au/rtc2013na

EUROPE 2013

Delft
 the Netherlands
 27 – 28 September 2013

www.rtcevents.com.au/rtc2013eu

RTC is a unique, independent conference covering all things Revit - BIM and the whole ecosystem that supports it, and that goes to ensuring your success in the marketplace. RTC is an event, a movement for sharing and encouraging your passion. It's an opportunity for interactions with creative and inspiring people that will challenge you, encourage you.

Jose Fandos wrote of his experience: *"What made it so good? Let's see, where do I start? Focus, people, location, quality, organization, level of expertise of the speakers, duration of the conference, attention to detail, and so on. They were all interrelated."* - Andekan Blog

RTC is a user event - "by users, for users" - dedicated to the practical, even the impractical sometimes, application of technology to our work, our firms and careers.

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 cad solutions

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 architecture to new technologies

TOTAL SYNERGY

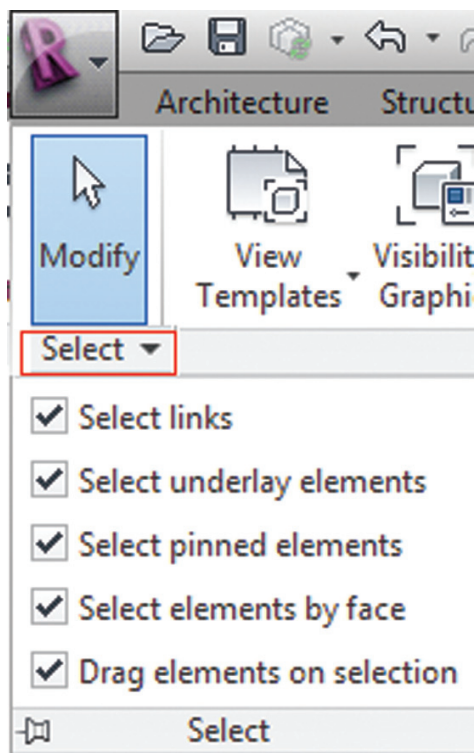


Figure B

SCHEDULES SHALL HAVE MORE FAMILY CATEGORIES AND USHERED IN WITH NEW FORMATTING ENHANCEMENTS

Scheduling Enhancements | Family Categories Added

This is great news! Now the following families are able to be scheduled.

- + Generic models
- + Entourage
- + Structural path, area, and fabric reinforcements
- + Beam systems
- + Pads
- + Levels
- + Grids
- + Architectural columns
- + Roof soffits
- + And many more

My personal favorite to be added to the schedule list is the level. This is the first time that the elevation of a level can be scheduled. Before, the only way to schedule an elevation of a level was via the elevation of a footing. Also, phase properties are able to be scheduled. This includes phases to be created and phases to be demolished.

THE SHADE WILL DESCEND UPON SCHEDULED TIME, WITH IMAGERY, COLOR AND LIGHT

Scheduling Enhancements

Major scheduling enhancements and layout changes have been made in Revit 2014. Some of the new enhancements include grid view formatting and cell formatting. These new features allow you to add column shading, borders, font overrides, insert rows and columns, delete rows and columns, merge cells, add images (add Images? Wow!), add project parameters, and add plain text to the schedule. Some of these new features are shown in Figure C.

Professional CAD/CAM Workstations



Award Winning Performance, USA Built

@Xi® Computer has been building the most performing AutoCAD® Workstations for over 20 years. The new Intel®Core™ i7 & XEON® based, MTower™ & PowerGo™ are no exception. As NVIDIA® TPP, we are offering **Maximus™ Certified Workstations** combining HPC and Visualization power in a single Desktop. Proudly Custom Built in the USA, sided by a superior domestic technical support, Xi Computers are designed to excel and reliably deliver, even in the most demanding computational environments.



MTower PCIe

PowerGo

Mtower 2P64X

- Intel® Core™ i5/i7 3570/3770K
- Intel Z77 C.S. USB & PCIe 3.0
- 8GB-DDR3-1866MHz to 32GB
- NVIDIA®Quadro® K600 1GB 2H
- 120GB SATA6Gb Corsair® SSD
- 23.6" 1920x1080 Samsung® LED
- Xi®MTower Silent Liquid Cooled
- MS Windows® 7 Pro® -Linux®

Quad Core i5 3570K 4.0 Ghz \$1,649

Quad Core i7 3770K 4.5 Ghz \$1,979

- Intel Core i5/i7 3320M/3840QM
- up to 32MB Cache, Six Cores
- 8GB DDR3 1600MHz to 32GB
- NVIDIA®Quadro® 2GB Kepler™
- 750GB SATA6Gb Hybrid SSD
- 15.6/17.3" 1920x1080 LED
- Speakers, Camera, 1394+ Mike
- MS Windows® 7 Professional®

"154" i5 3320 K2000M \$1,649

"XT" i7 3840 K3000M \$2,749

- Intel Xeon®Processor, E5 Series
- 10/20MB L3Cache,C602 Chipset
- 16GB DDR3-1600 ECC to128G
- NVIDIA®Quadro® K2000 2GB
- 240GB SATA6Gb Corsair® SSD
- 27" 1920x1080 LCD Monitor
- Xi®MTower 1000W HAF-XM
- MS Windows® 7 Pro® -Linux®

1x4-Core E5-1620 3.9GHzTB\$2,279

2x8-Core E5-2687W 3.1GHz \$6,599



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Revit Architecture 2014

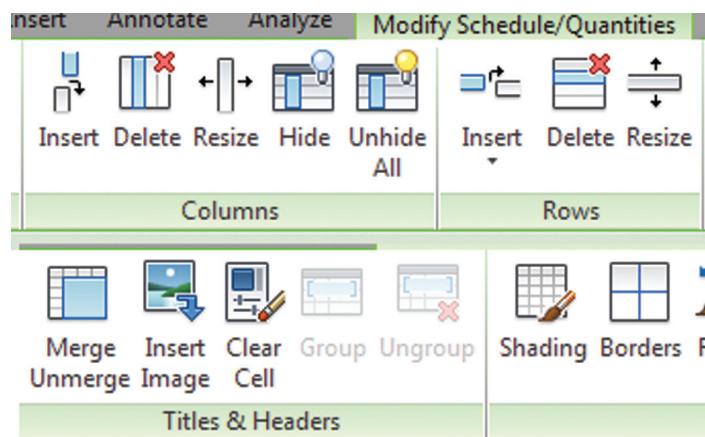


Figure C

DOUBLE-CLICKING ELEMENTS SHALL SAVE YOU TIME AND MONEY

New Feature | Double-Clicking Elements Places Them in Edit Mode

This feature's title explains it all. Prior to Revit 2014, if you ever wanted to edit an element you would have to click on the family then click "edit" in the ribbon. Not anymore! For example, double-clicking on a non-system family in Revit 2014 will automatically open the family in the family editor. Double-clicking on elements places them in edit mode. System and non-system families, sketch-based elements, views and schedules, assemblies, groups, and stairs drawn as components are allowed to be edited by double-clicking. Note that some elements have multiple edit modes and double-clicking that element may yield an edit mode you may not want. For example, non-system families have both edit type and edit family and double-clicking by default will activate the "edit family." There are double-click settings under the options menu (see Figure D). If you are unsure, just single click and click edit the element the old fashioned way.

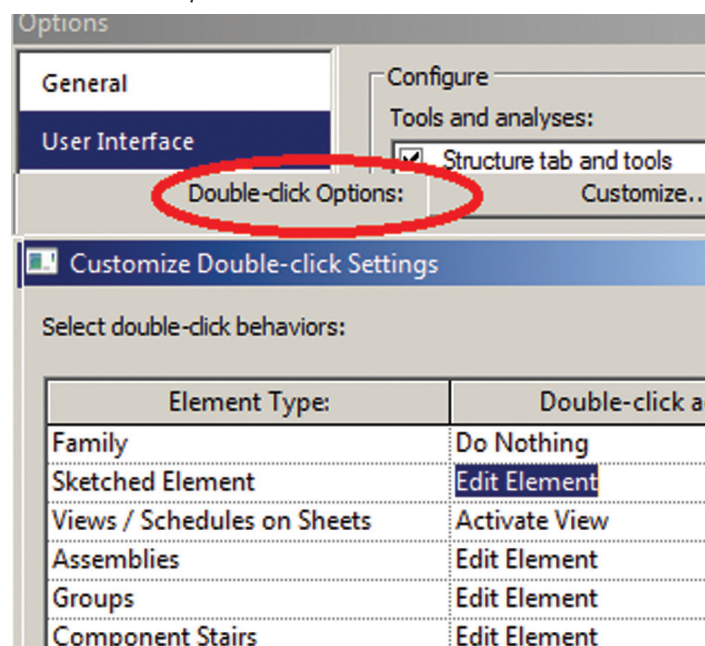


Figure D

In closing: even Revitdamus knows to look in the Help System (yes, it's still F1) and thoroughly explore the "What's New" section, as well as go into every (read as EVERY) tool, button, drop-down, setting in the Revit 2014 interface and explore with two concepts held in mind:

- See if you can find that which is new, yet not documented.
- What is available that I do not currently know?

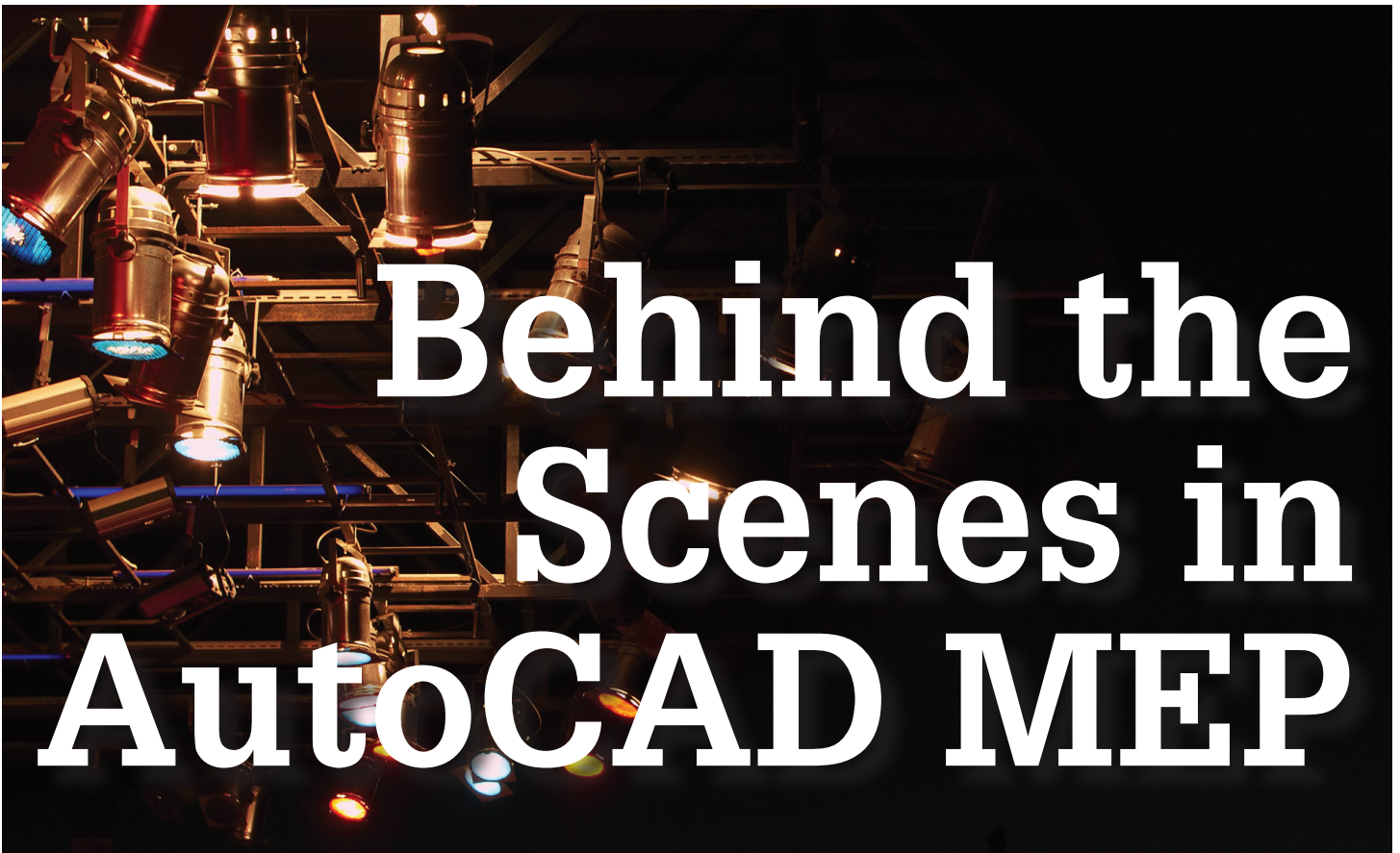
Knowing what is "there" will give you power beyond current limitations.



Jay B Zallan is Director of BIM at Perkowitz+Ruth Architects & Studio-111, Jay brings unique & qualified insights into the business & creative processes of Architecture with proven strategies for production & growth. Mr. Zallan has over 20 years of Architectural experience and enjoys a varied & diverse portfolio of Architecture and Art. He is currently the President of the Los Angeles Revit Users Group, AUGIworld magazine Revit Architecture Content Manager, BIM Advisory Board member for Graphic Standards and he is a frequent lecturer on Creativity, BIM and Virtual Design & Construction. He can also be found presenting at Autodesk University, Revit Technology Conference and as a guest lecturer at the University of Southern California, LACMA, as well as many other industry & AIA events.



Marcello Sgambelluri is the BIM Director at John A. Martin & Associates Structural Engineers in Los Angeles, CA. He has been using Autodesk products for over 15 years including AutoCAD, 3ds Max, and Revit Structure. He is a member of the ASCE-SEI BIM committee and continually speaks at structural professional conferences across the country. Marcello teaches classes regularly at Autodesk University that focuses on free form modeling in Revit and he beta tests the yearly releases of Revit. He has worked on many projects that incorporated complex geometry including the Walt Disney Concert Hall in Los Angeles, CA, the Stata Center at MIT, and the Tom Bradley International Terminal Expansion at LAX. Marcello received B.S. and M.S. degrees in Civil Engineering and is a licensed Civil and Structural Engineer.



In this month's AutoCAD® MEP focus article, we'll look at some lesser-known or under-utilized tools in the program. Hopefully, these few tips and tricks can help you better utilize MEP and make you more productive.

First we'll start with something simple but extremely useful that can benefit users at any level. This is customizing the CUI, or Customize User Interface, file to maximize our effectiveness and time management while drafting.

Start this process by inputting CUI in the command line which will open the CUI dialog box (Figure 1). All the different options and menus can be a little overwhelming, but it really isn't that complicated.

The first thing to do is 'save as' the current CUI file as your own. That way you can always go back to the stock CUI file that comes with AutoCAD in case something gets messed up down the road.

There are many options within the CUI interface, but we'll look at adding custom commands that can help on a daily basis. We'll build a custom command that zoom extents, purges the drawing, and does a save. This is something I use every day in coordination efforts with other contractors who don't need/want miscellaneous xrefs and layers I may use. We can easily build this command and add a button to the ribbon using our CUI file.

After saving the CUI file as your own, hit the Create New Command button (Figure 2). On the right side of the CUI editor is a properties dialog box to fill out with the information involved with the command making (Figure 3). We'll input the actual command in the line labeled Macro. This is where we can enter the same commands we use in the command line. There are a couple special characters we'll use in the Macro input box:

- ^C – Escape Key
- ; – Enter Key
- \ – Pause for User Input

For the sample command we're building, the input will look like this:

– ^C^C_zoomextents;purge;qsave;

The double '^C' at the beginning ensures we exit any possible command we're in at the time.

Now we'll make an actual image to use as our new button. I'm going to use the 'Save' button image as a place to start, then add my own text on top to differentiate it from the standard button, in this case 'BIM' so I know it is my own button (see Figure 4).

The last thing to do is add this button to the ribbon, menu, or toolbar. Do this by dragging and dropping the button wherever you want it.

Now that was a fairly easy but very useful customization that will help us on a daily basis.

AutoCAD MEP 2013

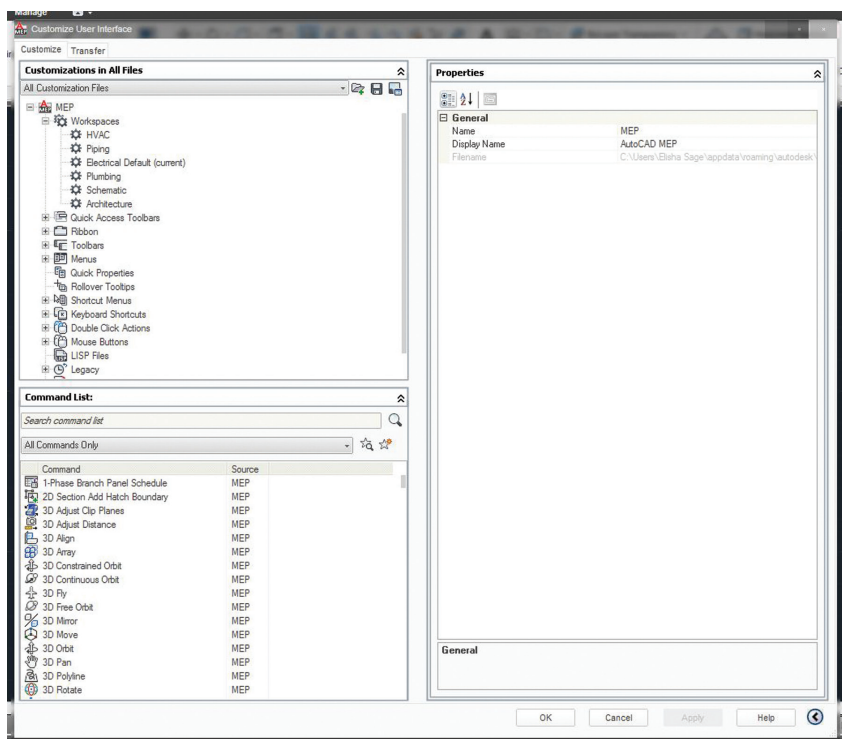


Figure 1

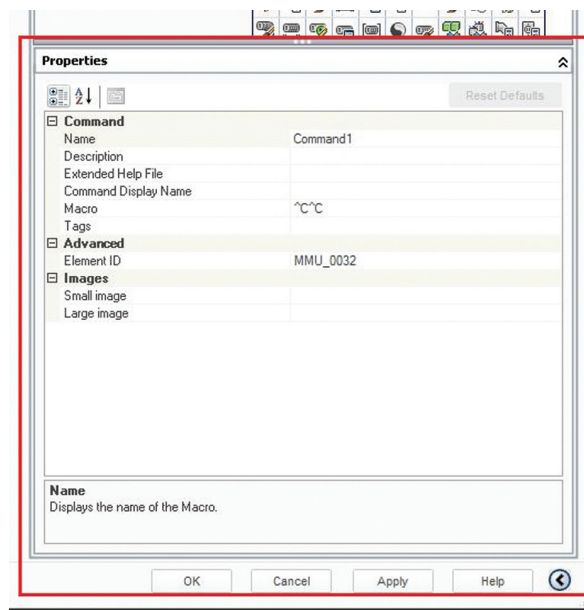


Figure 3

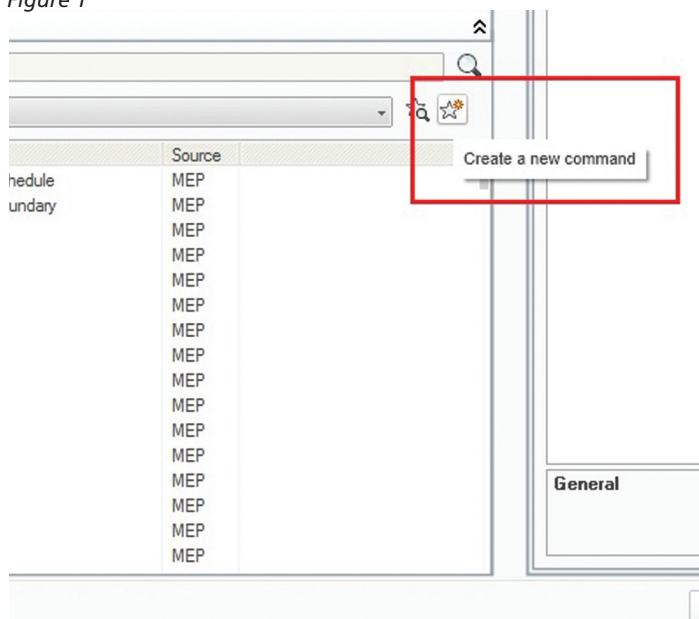


Figure 2

CONSOLE MODE

I'm sure that most users of AutoCAD MEP use blocks in their drawings. I'm also sure there are plenty of people using LISP commands for any number of actions within AutoCAD. Sometimes we want to make changes but don't really need the actual graphical interface opened. AutoCAD has a tool for this called "Console Mode" (Figure 5).

Console Mode is a command line interface that is a fast, simplified version without the graphical window. What is so great about this mode is it loads drawings extremely fast and can still use most commands. It also allows someone who normally isn't capable of opening certain drawings to work on them.

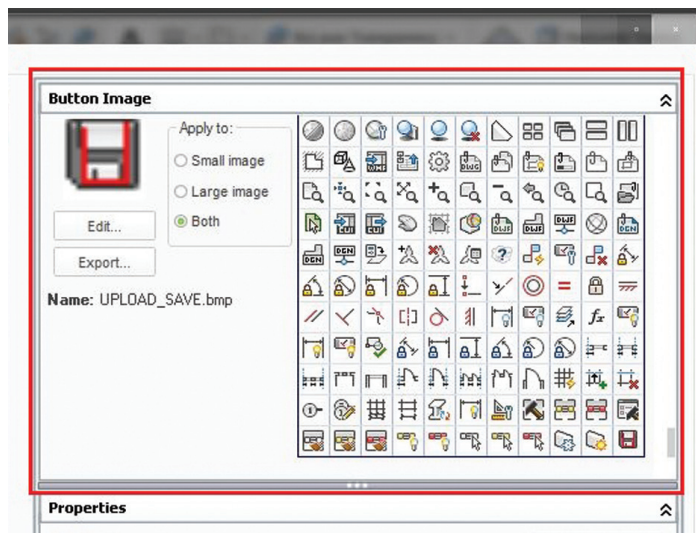


Figure 4

We can purge the drawing, changes layers, insert blocks, and software developers can run workflows. This can also enable us to easily run script commands and automated operations such as LISP commands.

CUSTOM SIZES

Now let's look at something we can do with the catalog editor that can help us in everyday drafting.

Sometimes we have a unique need for a certain size conduit/pipe/duct/cable tray or any number of items within our MEP catalogs. Here's how to add additional custom sizes we may need.


```
AutoCAD Core Engine Console - Copyright Autodesk, Inc 2009-2011.
Usage:
AcCoreConsole.exe [/i <input dwg>] /s <script> [/l <language>] [/isolate <userid>]
Example:
AcCoreConsole.exe /i 8th_floor.dwg /s test.scr /l en-US
Command:
Command:
Command:
Command:
ACADUER = "19.0s <LMS Tech>" <read only>
Command: SAUERES_
```

Figure 5

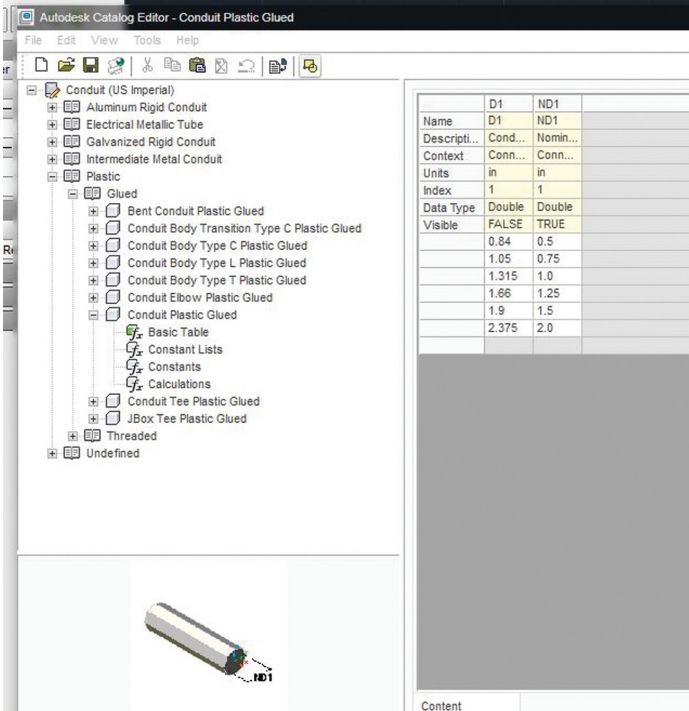


Figure 6

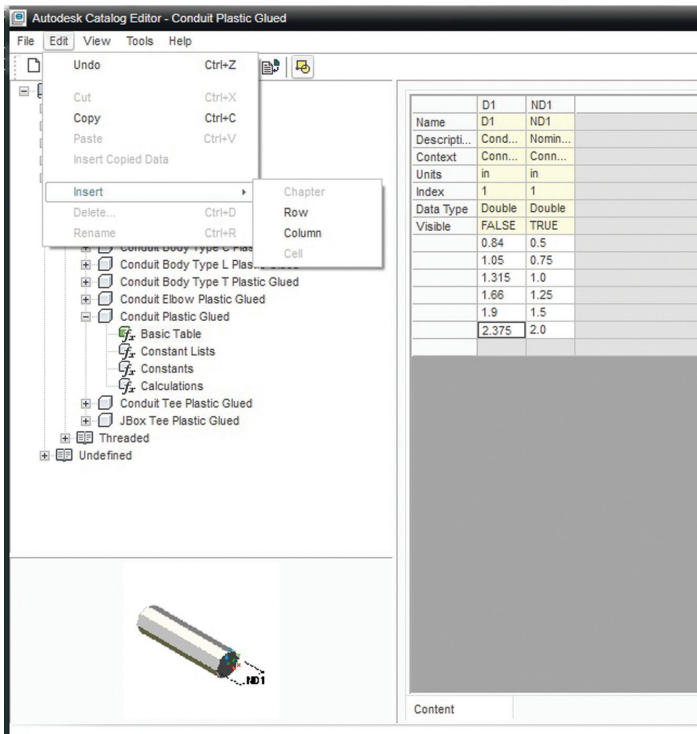


Figure 7

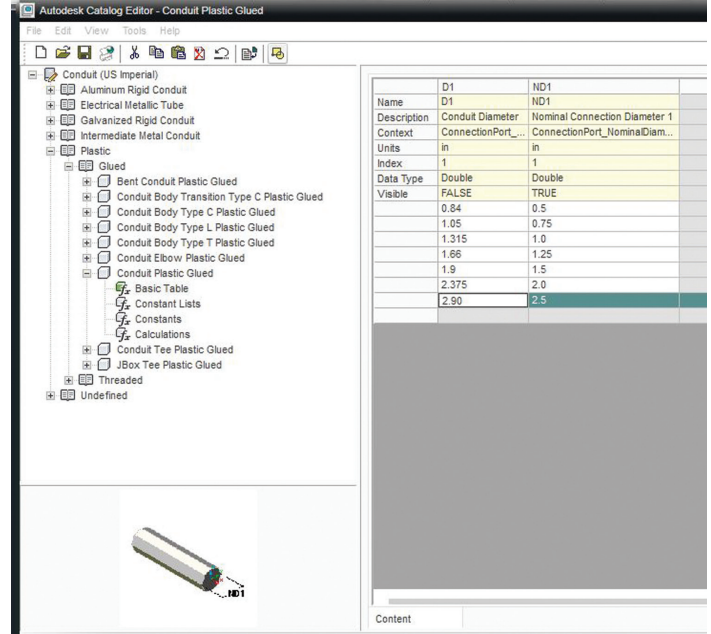


Figure 8

For example, I am going to add sizes to the plastic conduit in the US Imperial catalog. By default the conduit only goes up to 2". Let's step through this process and you'll see how simple it is.

Start by opening the Content Editor from the Manage tab in the toolbar. Once Content Editor is open, use the Open command to open the appropriate catalog we need to edit. In this case it will be the Conduit (US Imperial). By default, all catalogs are located at the following path: C:\ProgramData\Autodesk\MEP 2012\enu\MEPContent\USI\. For this case we will choose Conduit folder and then Conduit (US Imperial) .apc file.

With the catalog open, we can begin to edit the desired part system. We will start with the Plastic-> Glued->Conduit Plastic Glued. This gets us to the tables we need to edit (Figure 6). Start by left clicking on the last part size in the table, then going up to the menu bar and under Edit->Insert->Row (Figure 7). Now we have inserted a row on which we can add our own size of conduit.

We'll take the next step up and add 2 1/2" plastic conduit. The first column has the overall diameter of the conduit [D1] and the second column has the inside diameter of the conduit [ND1]. We'll add the 2 1/2" to the [ND1] column and 2.9 to the [D1] column (Figure 8). This completes the process for the straight piece of conduit.

Now we need to repeat the process for any other parts that we may use for the plastic glued conduit. The process will be the same. There may be more parameters to enter, such as radius or other lengths, but it's very straightforward.

There are a couple more steps to getting MEP to recognize that we've added this new size to our part catalog. First we have to run the command CATALOGREGEN. The purpose of this command is pretty self explanatory.

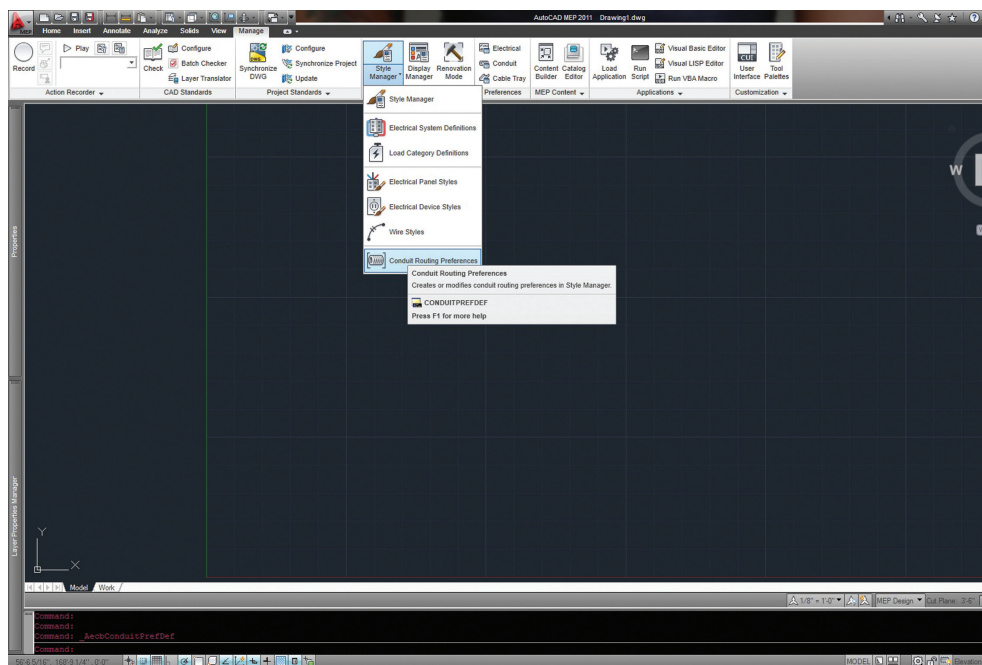


Figure 9

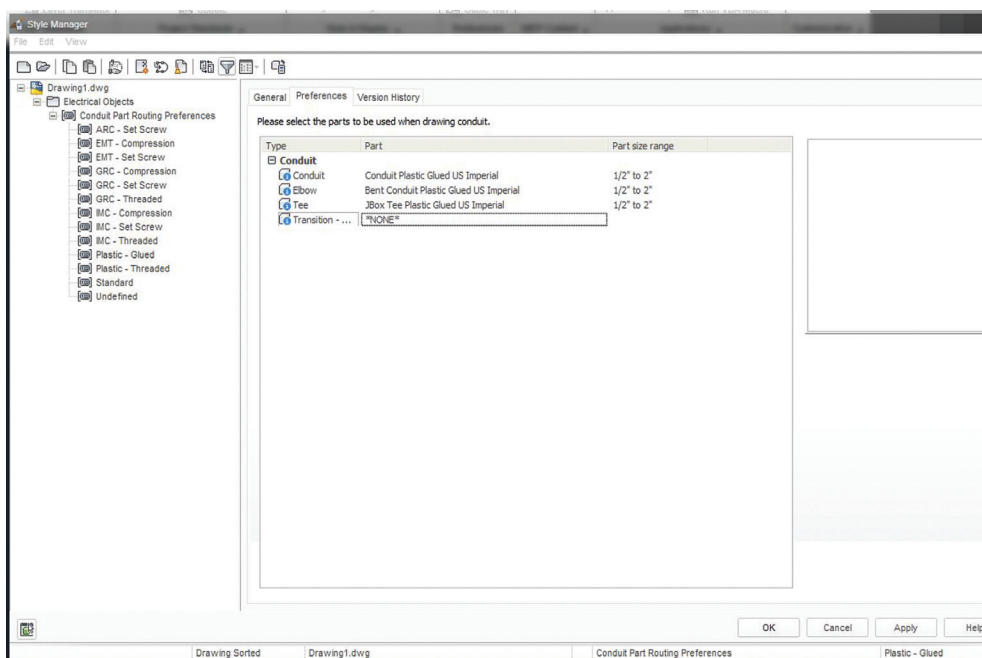


Figure 10

Second we have to update the PVC/Plastic Routing Preference. We do this because by default it only includes up to 2" conduit shown in the drop-down menu for conduit sizes. To update our Routing preferences, go to the Manage tab->Style Manager drop-down->Conduit Routing Preferences (Figure 9). With that menu open, update the sizes available by selecting "NONE" under transition type (Figure 10). Now press Apply and close the Routing Preferences window. We're almost done! The only thing left to do is SAVE the drawing that we've been in while doing all this editing, close it, then reopen the same drawing and voila—we now have the ability to add the custom-sized part to our drawing. Not too bad at all.

PROTECT THE STANDARD

I'd like to touch on a couple things that I'm sure most of us deal with within our companies from time to time: company and drawings standards. For better or worse, every CAD detailer has his/her own way of drawing, maintaining drawings, setting up the user interface, and so on. Sometimes this can cause a big headache for companies that are trying to maintain some sort of company standard.

AutoCAD actually has a tool that can help a CAD manager maintain order—the Enterprise CUIx File. This tool allows the CAD manager to make the CUIx file read-only on all user machines in the company.

The process is very simple. The CAD Manager creates the CUIx file they want the company to use and saves it to a shared network location. To ensure that no one can modify the file, the folder should be shared as Read-Only. Then each CAD machine will need to have the new CUIx file imported. This can be done on each machine individually or by using the Deployment wizard. And that's it—every machine will have the same look and feel and tools available.

I hope that these tools in AutoCAD MEP can help you on a day-to-day basis. Each year, AutoCAD grows more and more, giving us tools that help us work smarter and faster. Sometimes we just need a little guidance to find these tools and a bit of advice to be able to use them to our advantage.



Elisha Sage currently works for Walker Engineering in San Antonio, Texas. He is the BIM Coordinator and CAD Engineer for Walker's San Antonio branch. Elisha grew up in Michigan and attended Lawrence Technological University where he received his Bachelors in Mechanical Engineering. He has had almost 5 years of experience in the BIM coordination and CAD field working for electrical and low voltage contractors. He plans on utilizing his CAD and BIM skills to allow him to continue to grow with his company.



Better Model Definition



From 10,000 feet, if you look at the Autodesk® Revit® Structure ribbon you will not see any differences between Revit Structure 2013 and 2014 as displayed in Figure 1 below.

But dig a little bit deeper and you will discover some changes that are geared toward providing more control over the rebar and

structural elements in the model. This article will look at the areas to pay attention to in the Revit Structure 2014 release—rebar definitions, annotation, and the manipulation for all steel framing.

REBAR ENHANCEMENTS / CONTROL

In Revit Structure 2013 when you added a hook to the Std Rebar shape, a new shape was automatically added. Then if you added a hook to both ends, yet another rebar shape was generated. This is

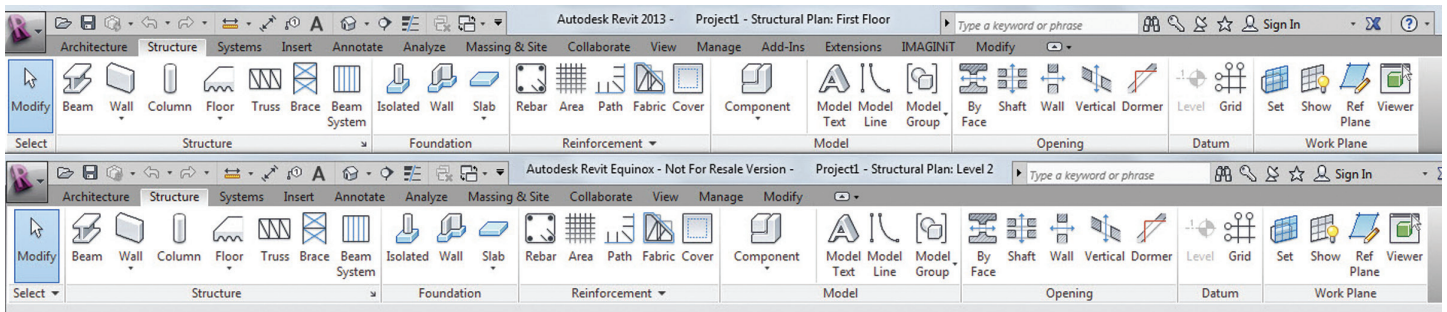


Figure 1: Revit ribbon comparison

Revit Structure 2014

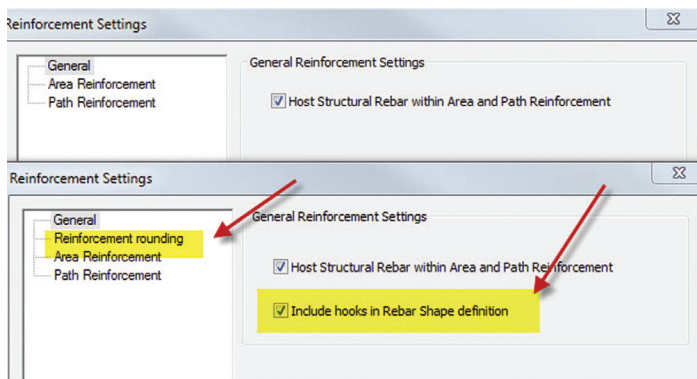


Figure 2: Reinforcement settings in 2013 (top) and 2014 (bottom)

not the case in Revit Structure 2014—the original shape does not change when a hook is added at one or both ends.

As you can see in Figure 2, this has been accomplished with the new setting in Reinforcement. The top portion of Figure 2 shows Reinforcement settings from Revit Structure 2013 and below it is Revit Structure 2014. So by including hooks in the rebar shape definition, the number of custom shapes created is minimized on your projects.

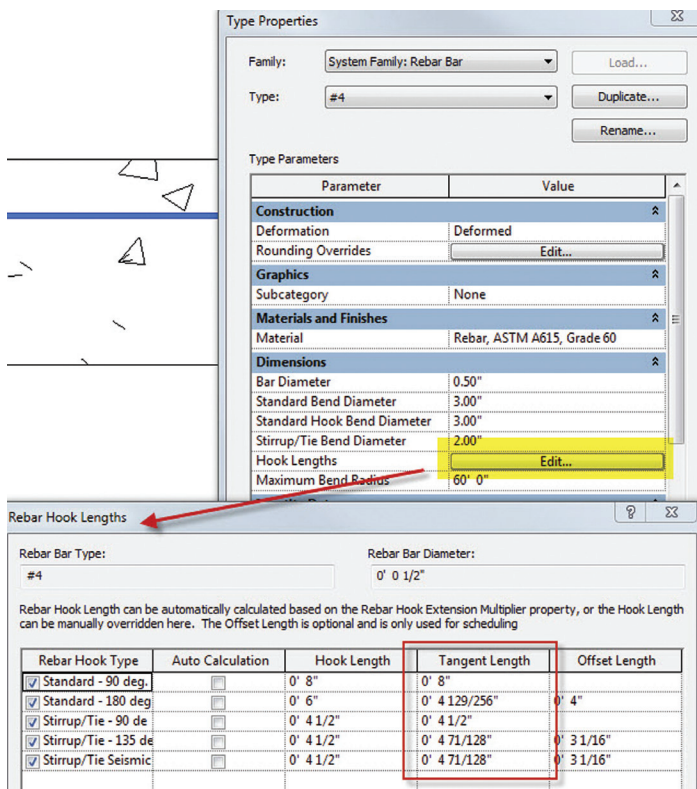


Figure 3: Rebar hook tangent lengths

Rebar tangent hook lengths can now be controlled in the type properties of the rebar. Figure 3 shows where to access the settings and Figure 4 gives a graphical example of where the tangent length is applied to the rebar hook.

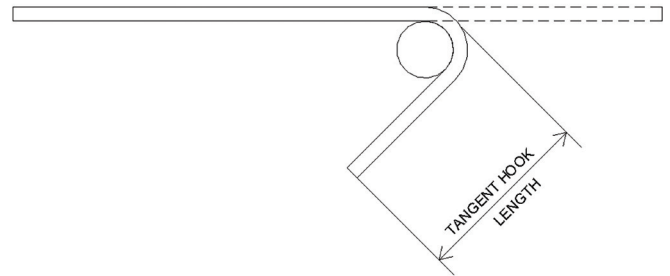


Figure 4: Sample of where tangent length is applied

Revit Structure 2014 allows the user to apply unique rounding values to rebar lengths that are controlled separately from the project units. Figure 5 below shows a piece of rebar selected and in the instance properties you can control by selecting "Rounding Overrides."

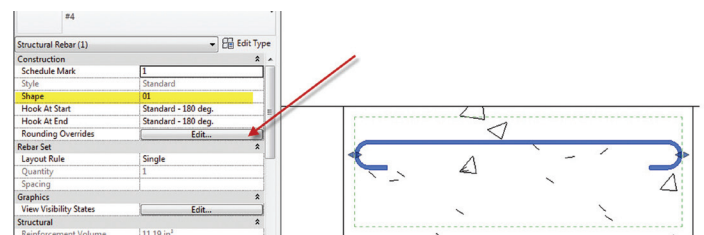


Figure 5: Rebar properties

Figure 6 shows the reinforcement rounding overrides that can be applied to bar length and bar segment length.

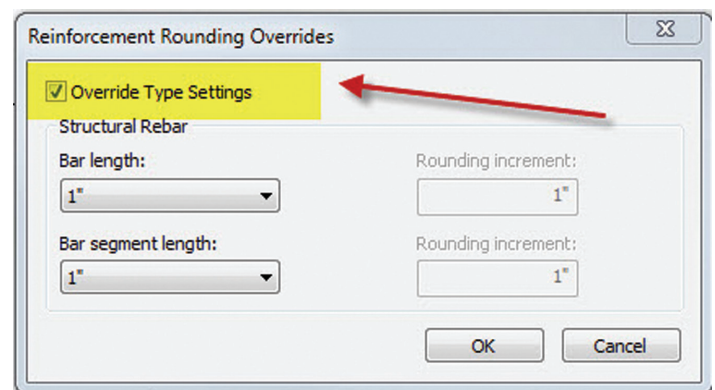


Figure 6: Reinforcement rounding overrides

STEEL FRAMING GEOMETRY MANIPULATION

There is now more control over beam and brace justification in both directions. This makes the physical geometry act more like the analytical representations. Figure 7 shows a side-by-side comparison of Revit 2013 and Revit 2014 instance properties of a beam.

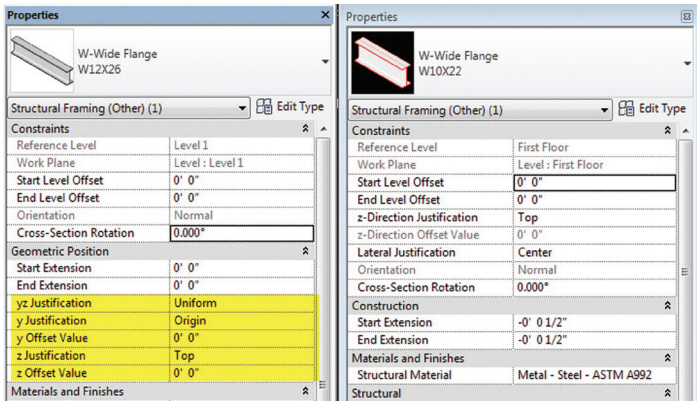


Figure 7: Geometric positioning

Figure 8 shows the result of applying independent Y offset to a beam instead of a uniform offset, which would affect both ends.

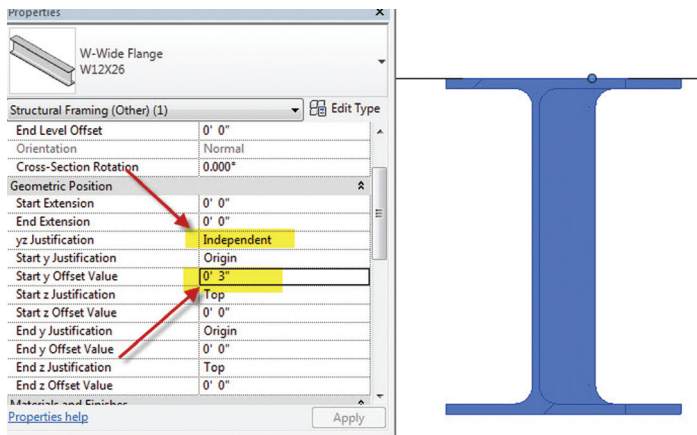
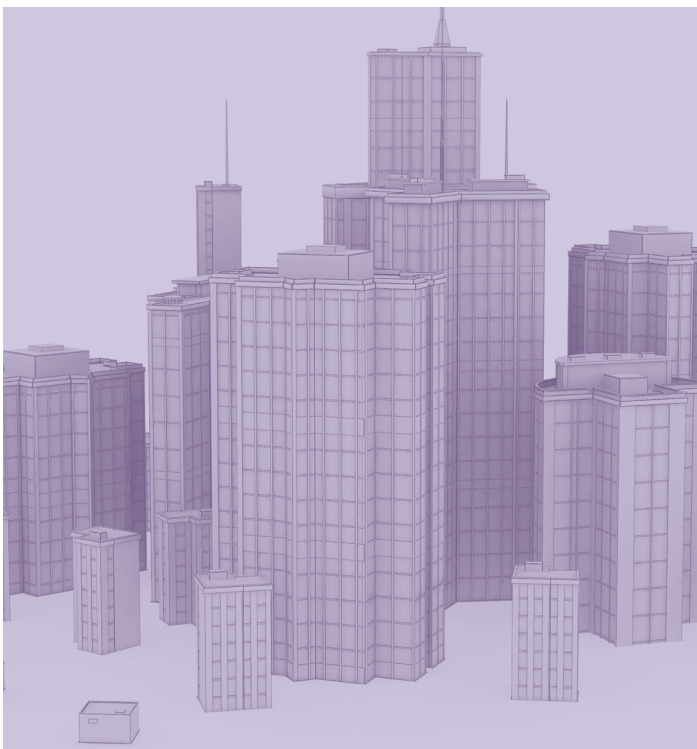


Figure 8: Assigning independent offsets



The independent offsets also allow you to control the point of origin where the offset will be applied. Figure 9 shows the drop-down in the instance properties of the beam or brace selected.

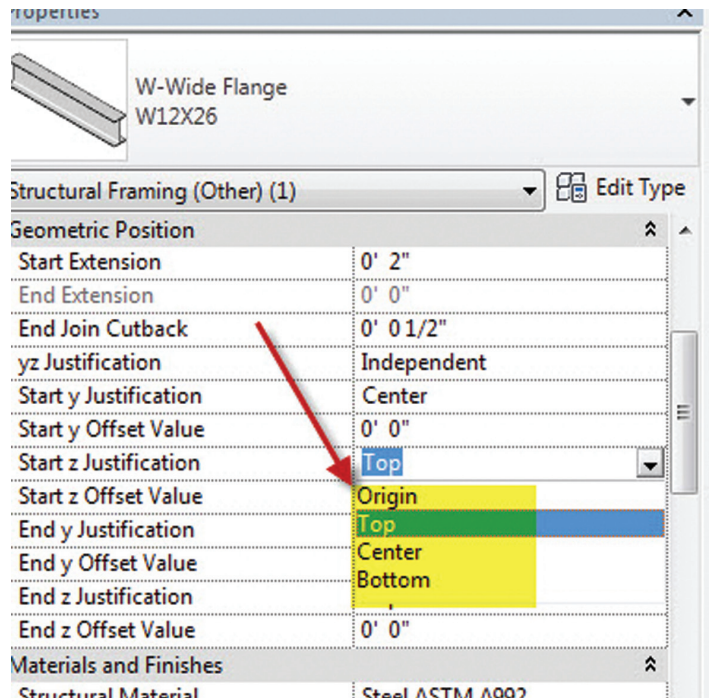


Figure 9: Offset origination

To round out the added features to geometry manipulation we will finish with start and end cutbacks being applied while placing a beam or brace. Figure 10 shows the instance properties of a beam being placed.

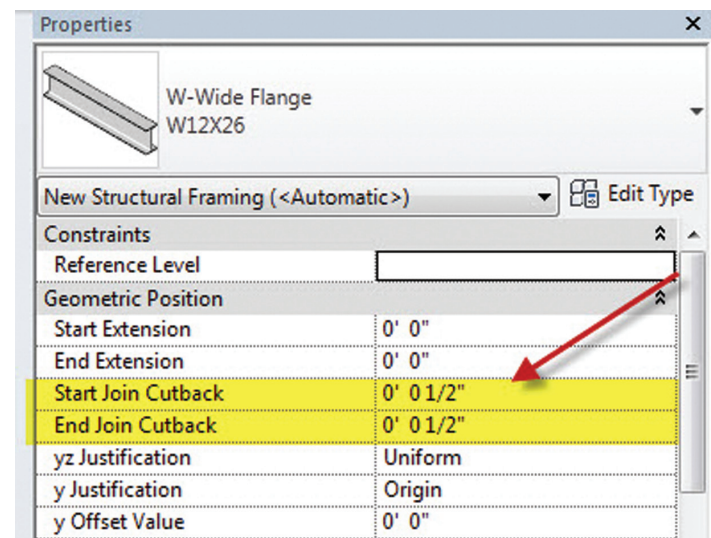


Figure 10: Beam cutback during placement

Revit Structure 2014

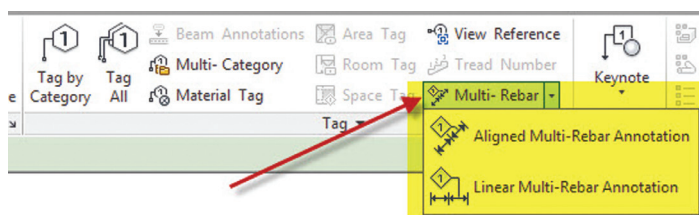


Figure 11: Multi-Rebar Annotation tool

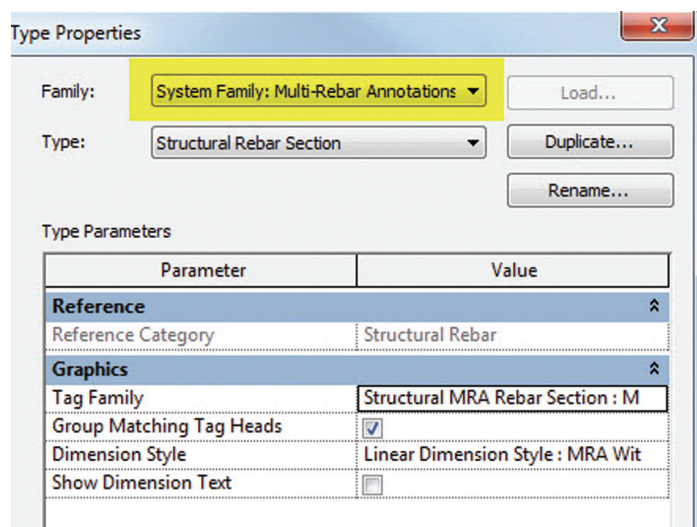


Figure 12: Multi-Rebar Annotation properties

All of these added tools for geometry manipulation allow the Revit Structure designer to generate more accurate models that are more in line with the analytical model.

MULTI-REFERENCE ANNOTATIONS (MRA)

Revit Structure 2014 introduces a new annotation tool called Multi-Reference Annotation (MRA). Yes, another acronym to memorize! When you are producing construction documents, this new tool allows you to annotate multiple references, such as rebar and rebar sets, with a single tag.

SUMMARY

Although this release of Revit Structure does not offer a lot of "huge" features, there are enough tools there to better define your model, improve correlation with your analytical model, and

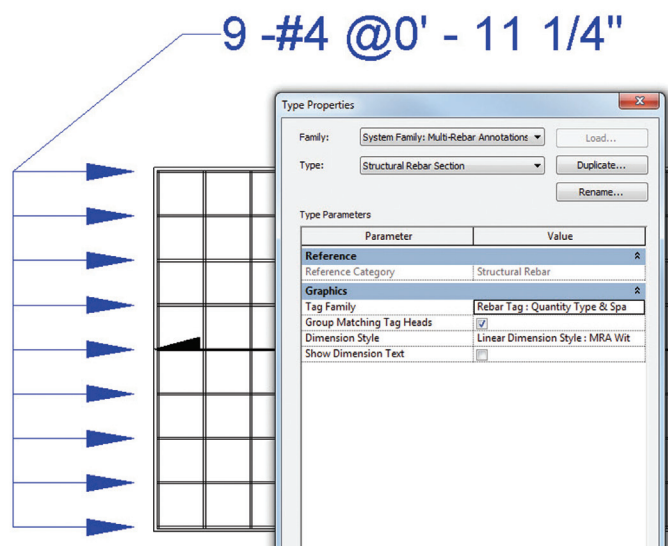


Figure 13: Sample Multi-Rebar Annotation

clean up some annoyances from previous releases. As always, the API side of things is becoming more available and organized to help the evolution of the software and integration with external analysis tools.



Philip Russo began with AutoCAD version 2.5 in 1986. Through the years he has held positions in the CAD industry as CAD Draftsmen, CAD Manager, Sr, Applications Engineer, and is a Certified Autodesk Instructor. Lately Phil's focus has been on the implementation of standard practices for the Revit platform. He currently holds the position of Sr. Technical Application analyst at O'Brien & Gere Limited and has his professional product certifications for Revit Architecture 2013, 3DS Max 2103, and AutoCAD 2013. O'Brien & Gere is an engineering firm located in Syracuse, New York. Phil can be reached at phil.russo@obg.com



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The Proof Is in the Pudding

My roles as civil engineering practitioner and infrastructure and land development technology consultant means that I am driven by helping civil engineering organizations become more efficient with the use of design technology—specifically AutoCAD® Civil 3D. My industry experience takes me back to the days of DCA Engineering and Software—where Autodesk's civil infrastructure and land development solutions began—and through the transitions from Softdesk, to Land Desktop, and the continual evolving releases of AutoCAD Civil 3D.

Without a doubt, the major challenge that has plagued our industry through the years of technology evolution is underutilization. It is interesting to note that the nature of these challenges has changed with the technology. With the move from mylar/ink and AutoCAD to Softdesk and Land Development Desktop, the challenges manifested themselves in the convergence of drafting and design roles. With AutoCAD Civil 3D, firms have begun to embrace these required role changes and are finding that employees are able to design more efficiently, but often times struggle with representing designs in good quality production drawings.

It is interesting to note that Autodesk has responded to the civil engineering industry's desire for better design tools and improved

data sharing/collaboration capability. Yet on the whole, our industry has not responded appropriately to embrace what we have asked for. We need to embrace BIM technology and give it the attention it deserves, by developing project based technology utilization strategies that encompass the development of design/production standards, data sharing protocols and even staff training—that account for conception to completion deliverables. We are no longer dealing with simple AutoCAD and must give this technology the attention it deserves.

So why do I recount history when writing an article about new features in AutoCAD Civil 3D 2014? This is because much of the new functionality offered in AutoCAD Civil 3D 2014 continues to improve on existing data-sharing capabilities, and therefore warrants special consideration by engineering design teams when developing project specific strategies for data sharing and workflows. Essentially, data sharing and collaboration functionality have improved in AutoCAD Civil 3D 2014, but in order to properly embrace the new offering, we need to put the appropriate systems in place. Furthermore, I was pleased to learn that AutoCAD Civil 3D 2014 improvements are oriented to existing feature set enhancements, as opposed to introducing new feature sets. This is clearly a sign that enhancements to existing functionality and stability of the latest release was at the forefront of the development process.

AUTOCAD CIVIL 3D 2013 AND 2014 MODEL INTEROPERABILITY

For the majority of the user base, AutoCAD Civil 3D 2013 and 2014 model interoperability is the most significant enhancement to the new product, and will undoubtedly have the most significant impact on the user base when working with clients and other business partners. In the past there have been enormous constraints put on our workflows and software versioning strategies due to lack of backwards compatibility for AutoCAD Civil 3D objects. This is no longer the case because you will be able to use AutoCAD Civil 3D 2013 for opening, editing, plotting, and saving drawings that were created using AutoCAD Civil 3D 2014, and vice versa of course. While organizations should strive to standardize corporate wide on single versions of AutoCAD Civil 3D (with noted exceptions), we lack that flexibility when working on large project teams and when meeting record drawing submission requirements of specific clients. This intra-version compatibility will be a welcome change that will undeniably enhance data flow and handoffs between business partners and clients.

DATA SHARING ENHANCEMENTS

While AutoCAD Civil 3D 2013 and 2014 interoperability can arguably be categorized as a data sharing enhancement, there are a few other data sharing enhancements that should be recognized. Before getting into the details it may be a good idea to quickly summarize the current data sharing capabilities in AutoCAD Civil 3D 2013, to put things in perspective. These are summarized in the following bullets:

- AutoCAD External References (Xrefs) – for sharing graphical data.
- AutoCAD Civil 3D Data Shortcuts and Reference Objects – for sharing AutoCAD Civil 3D surface, alignment, profile, pipe network, and view frame object data.
- Labeling AutoCAD Civil 3D through an AutoCAD External Reference.
- Section View (cross section) production in separate drawings using AutoCAD Civil 3D Data Shortcuts and Reference Objects (to create the alignment) and AutoCAD External References (corridor and surface section data can be pulled through the Xref).
- Autodesk Vault Collaboration AEC – a multifaceted data management technology that helps designers manage current and historical model, design, production, and other project data.

PRESSURE PIPE NETWORKS – DATA SHORTCUTS AND REFERENCE OBJECTS

In AutoCAD 2014 there are two new data sharing enhancements that can be added to this list. The first is that pressure pipe networks can be shared with other drawings/users using Data

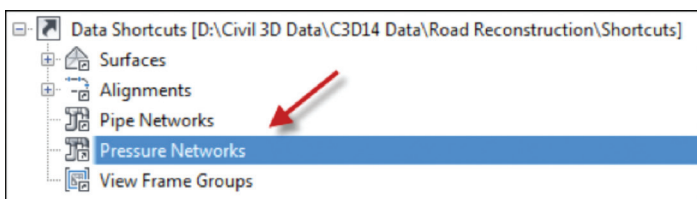


Figure 1

Shortcuts and Reference Objects (read ahead for other Pressure Pipe Network enhancements in AutoCAD Civil 3D 2014).

The new support for Pressure Pipe Network Data Shortcuts and Reference Objects is one of several Pressure Pipe Network enhancements that contribute to their “production readiness.”

CORRIDOR TARGETS THROUGH AUTOCAD EXTERNAL REFERENCES

The second data sharing enhancement in AutoCAD Civil 3D 2014 is that Corridor Targets can now be selected through an AutoCAD External Reference. This new functionality supports horizontal and vertical target mapping using Civil 3D survey figures and feature lines, as well as AutoCAD 2D and 3D polylines. As a transportation engineer, I was very excited with this enhancement because it give us increased flexibility when developing data sharing strategies between model and production drawings for medium to large transportation engineering projects. This means that when creating line drawings that show “offset geometry” for road and highway design projects, we must be more diligent and ensure that offset geometry is well formed using Object Snaps and “clean” geometry. While not immediately apparent, this new functionality means that Feature Lines and Survey Figures can be shared between model and production drawings. These objects are preferred over AutoCAD polylines for target mapping because you can assign a name to the object and identify clearly which objects have been targeted in the corridor target mapping dialog box.

PRESSURE PIPE NETWORK ENHANCEMENTS

Pressure Pipe Networks have undergone a serious upgrade in AutoCAD Civil 3D 2014. Above and beyond the previously mentioned capability to share Pressure Pipe Networks using Data Shortcuts and Reference Objects, there are a number of other enhancements that lend themselves to the “production ready” status for Pressure Pipe Networks.

A summary of Pressure Pipe Network enhancements in AutoCAD Civil 3D 2013 is as follows:

- Create Pressure Pipe Networks from Objects – AutoCAD 2D/3D polylines and splines, AutoCAD Civil 3D alignments, and survey figures can be used to create pressure pipes and bends. Arcs are converted into curved pipe segments and spline segments are converted into straight pipe segments, connected with bends. If none of the available bend angles can be used, then pipes are created without the fittings. Once the pressure network is created, you can use the Design Check command to identify pipes that exceed the allowable deflection or minimum flexible radius.
- Sliding and Moving Multiple Pressure Network Parts – You can now adjust the location of parts that branch off a pressure network by sliding them along the pipe or moving them together.

AutoCAD Civil 3D 2014

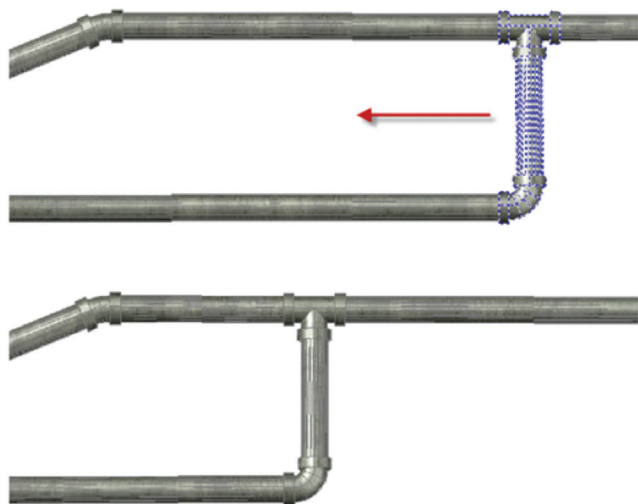


Figure 2: Sliding multiple pressure network parts in plan view along a pipe

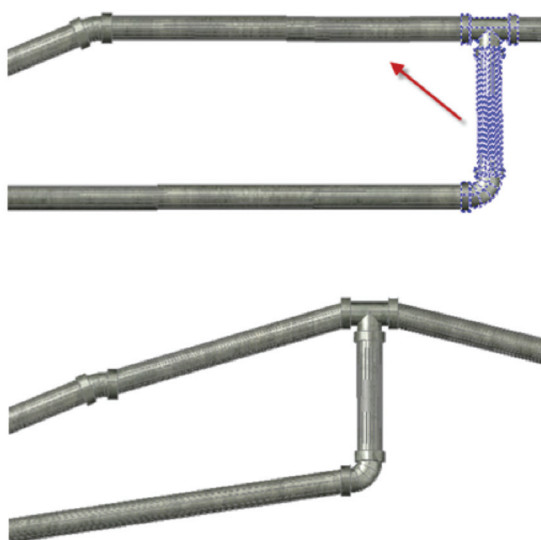


Figure 3: Moving multiple pressure network parts in plan view

- Edit Multiple Pressure Network Parts in Profile View By Changing Slope or Elevations – When you select the pipes and fittings between them you can modify the slope of several pipes at the same time. When you select the pipes and fittings between them, you can modify the elevation of several pipes at the same time.
- Compass 3D Plane – The plan view Layout Compass was introduced with Pressure Networks in AutoCAD Civil 3D 2013 to facilitate layout of pipes using allowable bends and deflection angles. In AutoCAD Civil 3D 2014, laying out a pressure network in model view is facilitated with the Compass 3D Plane.

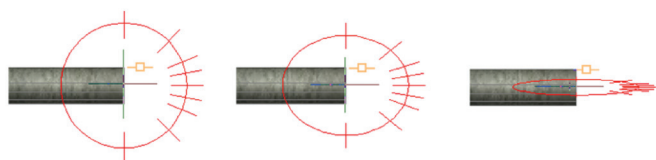


Figure 4: Compass 3D Plane

- Additional Grips and 3D Snap Compass Settings – You can now use the rotate grip and 3D Snap compass setting to rotate pressure network fittings and pressure network appurtenances in model views.
- Pressure Networks and Section / Profile Views - Pressure networks can now be added to Section Views and displayed as crossing pipes in Profile Views.
- Pressure Network Part List Sorting – Pressure network parts can now be sorted by size in the Parts List.

Pressure Network enhancements in AutoCAD Civil 3D 2014 are numerous and all encompassing, and now make this a viable feature in the modeling and production design environment.

OTHER UPDATES

There are a number of other improvements in AutoCAD Civil 3D 2014 that span a range of varying functionality. These are summarized below.

- Create Sections of Projected Solids – AutoCAD Civil 3D Section Views can currently display corridor, corridor surface, surface, pipe network, material, and pressure pipe network (2014) section data. You can now show an AutoCAD solid in a section view. This may be useful if you have represented retaining walls, abutments and wing walls, headwalls and other types of structures using AutoCAD solids, and wish to show these in a Section View created from a sample line.
- Extract Corridor Solids – You can now extract and create AutoCAD solids from corridor model shapes and links. You can extract AutoCAD bodies, AutoCAD solids, or AutoCAD swept solids. This functionality is especially useful for creating 3D models and renderings for proposed corridor designs, and facilitates the transfer of Civil 3D corridor data to AutoCAD-only drawings.

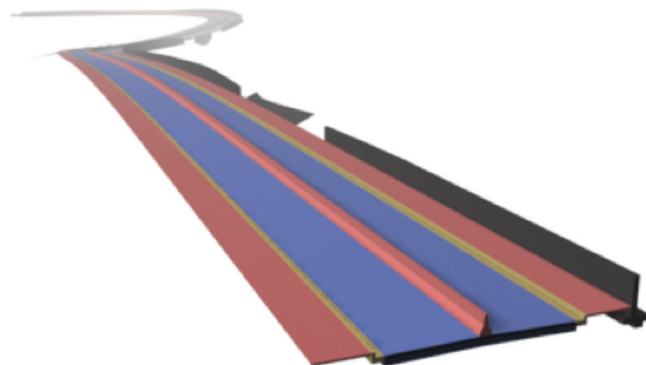


Figure 5: Extract Corridor Solids

- New Context Menu Material Lists Commands – There are new commands on the context menus to manage material lists and materials from sample line groups. This is a welcome addition because in prior releases, material lists were created without an editable naming template, and users now have better control over creating named material lists and creating reports for generated material lists.

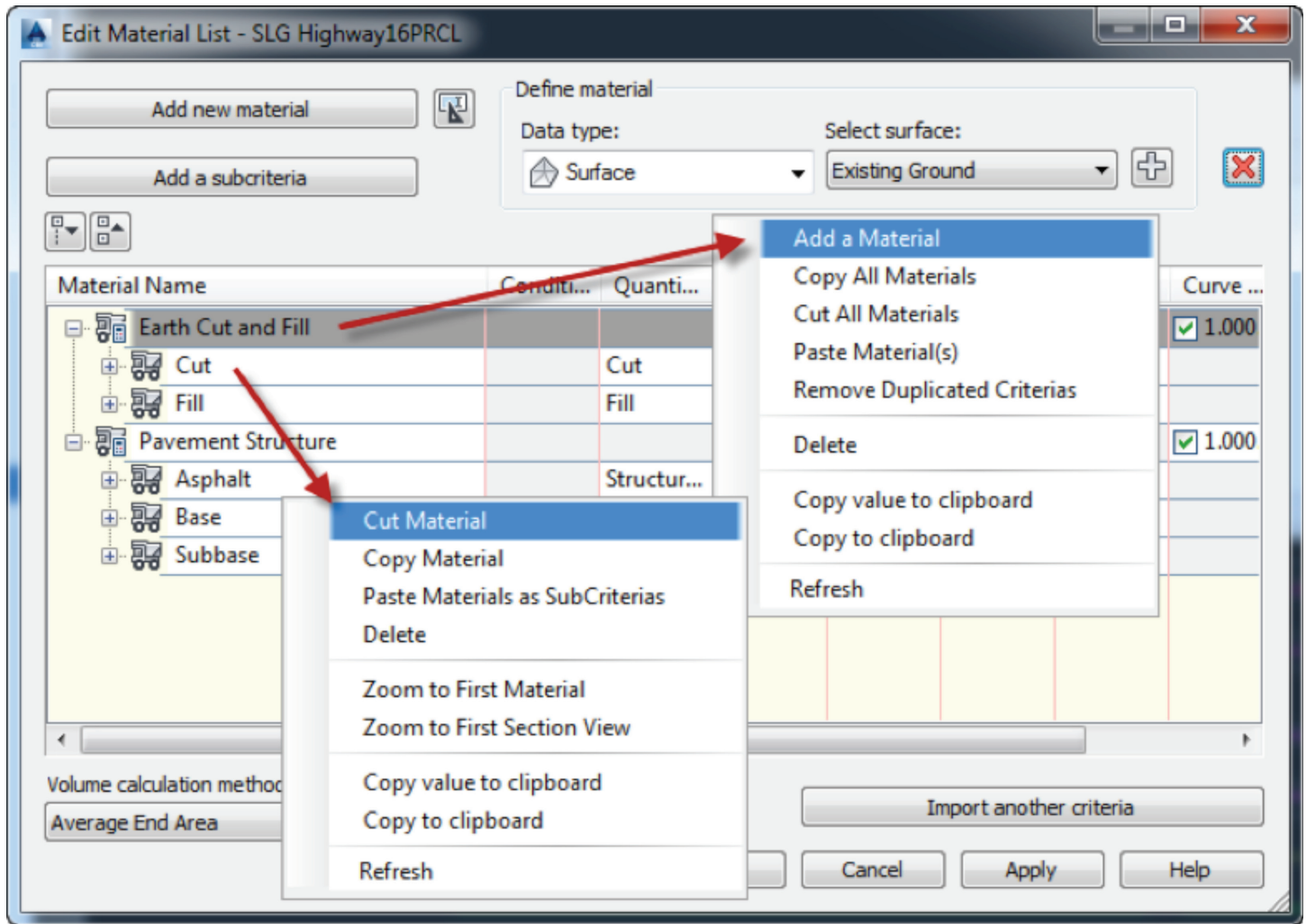


Figure 6: Context menus for sample line material lists

- Autodesk Infraworks and Autodesk WS – You can import pipes and civil roads from Autodesk Infraworks. You can also export profile data to Autodesk Infraworks. Drawings and their associated dependency files can be saved to Autodesk 360 and edited using AutoCAD WS. These enhancements will enable a much broader group of project team members to interact with model and production drawings, and will be particularly important in connecting field (construction, field survey and inspection) with office (project design team, reviewers, and other stakeholders). Workflow definition is a must with this new functionality.
- Annotation, Plan Production, and QTO – Pressure network pipes, fittings, and appurtenances can be displayed in tables. Also, you can add pressure networks to plan production sheets. Finally, pressure network parts can be assigned pay items in a parts list for QTO.
- Save Survey Query Files – Standardized survey queries can be exported for use in other survey databases.
- CAiCE Translator – A CAiCE Translator has been added to the Toolbox to facilitate the movement of CAiCE data to AutoCAD Civil 3D.

SUMMARY

As the title of the article indicates, the proof is in the pudding. With this new release of AutoCAD Civil 3D there is less emphasis on new features and more emphasis on enhancing existing functionality. In addition to enhancements and updates mentioned in this article, there are a number of other miscellaneous improvements geared towards increasing performance throughout the system. The most significant enhancements are the AutoCAD Civil 3D 2013/2014 interoperability followed by other data-sharing capabilities and then updates to pressure pipe networks. As always, do your homework before rolling out to the masses.



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Navisworks Joins the Material Family



Figure 1: Revit model rendered in Navisworks with Ray Trace

Autodesk Navisworks® 2014 has many major enhancements that extend the use of models among Autodesk products. These features include the use of Ray Trace, the Quantification tool, Measurement tool upgrades, Clash Detective upgrades, and the introduction of ReCap.

RAY TRACE HAS ARRIVED

An important enhancement to the Autodesk line of products is the introduction of Ray Trace to Navisworks. Completing the cycle, Navisworks will now render the Autodesk library of materials. This improvement is a remarkable step forward as it furthers collaboration among products. Any Autodesk materials applied to a model will persist in Navisworks. The look and feel of the model will be consistent from Autodesk product to Autodesk

product. Using the Ray Trace rendering engine, you can easily produce photorealistic images as though they were created in Autodesk® Revit®.

Furthering the rendering engine is the ability to create and apply Autodesk materials to the Navisworks model. Navisworks 2014 introduces the Autodesk Rendering palette where you can select any Autodesk material and apply it to the Navisworks model. Just as in other Autodesk software, you can edit a material and save the modified version.

The palette is broken out into two main panes. The top pane shows all the materials in the current document while the bottom pane shows all the materials in the selected library. In Figure 1, the Autodesk Library is selected.

The Autodesk library is broken up in the selection tree by category with multiple materials in each category. You can quickly navigate the selection tree and find the material to modify or apply to your model.

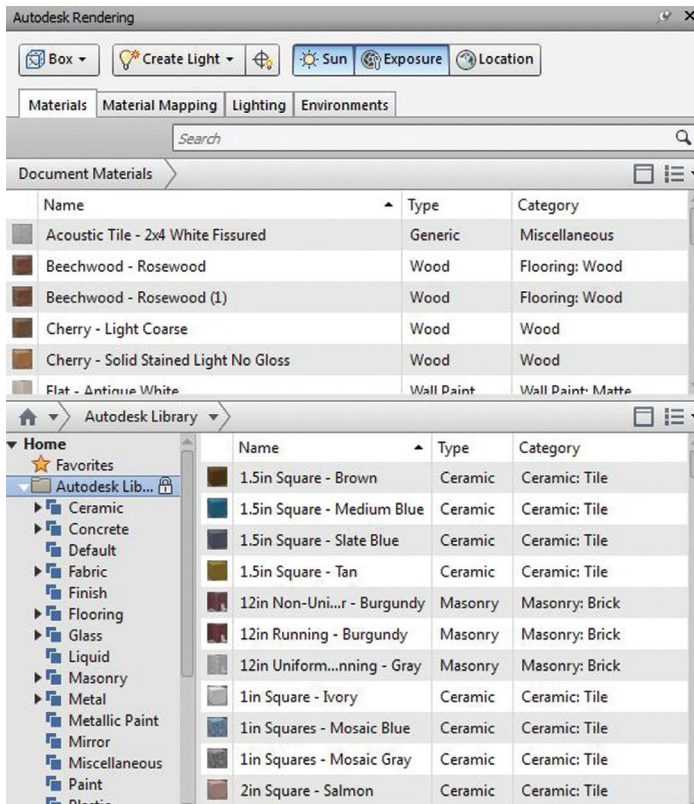


Figure 2: Autodesk Rendering

With Autodesk Rendering you can also create and modify lights and environments. The Lighting and Environment tabs allow access to the tools necessary to customize these settings. You can add point lights, spot lights, distant lights, and web lights. This is very beneficial as you can add lighting depth to the project. The Autodesk light controls are very similar to the Presenter light tools. Figure 3 shows a spot light configuration. Any point can be modified by using the gizmo. The light cone, angle of the light, and location of the light can be modified. This ensures that the lights are positioned correctly in your model to provide a photorealistic view when rendered.

Another enhancement that Autodesk Rendering brings to Navisworks is the ability to navigate the model with Ray Trace active. This experience is heavy on the graphics and is only effective if you have the hardware to keep up with the rendering process.

When you wish to produce an image or video that is rendered, simply click the Output tab on the ribbon > Rendered Image. Make sure you have

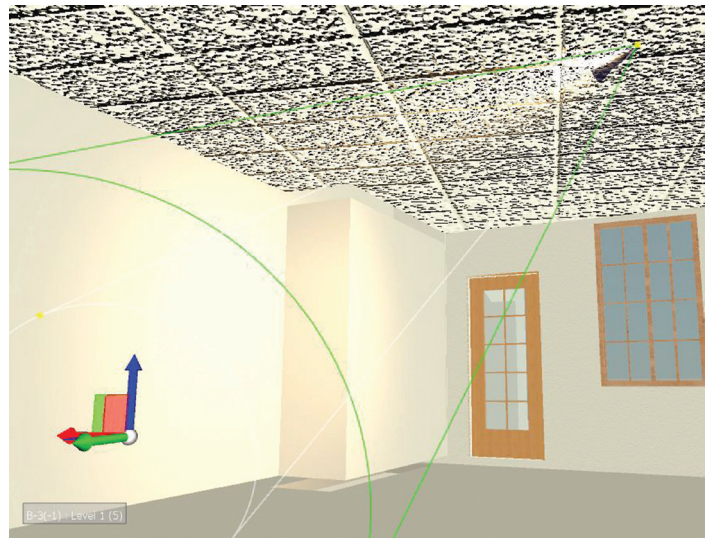


Figure 3: Autodesk Spot Light with Gizmo

Autodesk Rendering selected for your rendering image, and save the file.

CONSTRUCTING QUANTIFICATION CATALOGS

A great enhancement to Navisworks is the ability to quantify the model. The Quantification tool in Navisworks lets you associate model geometry to a catalog. All constructed catalog items are displayed in the Quantification tool selection Tree pane. The workbook selection tree is a construction of two other catalogs: the Item Catalog and the Resource Catalog.

The Item Catalog is required to associate any quantities to the selection tree. These items are used to name the summary level information of calculated quantities. An example of an item is a 4" concrete slab.

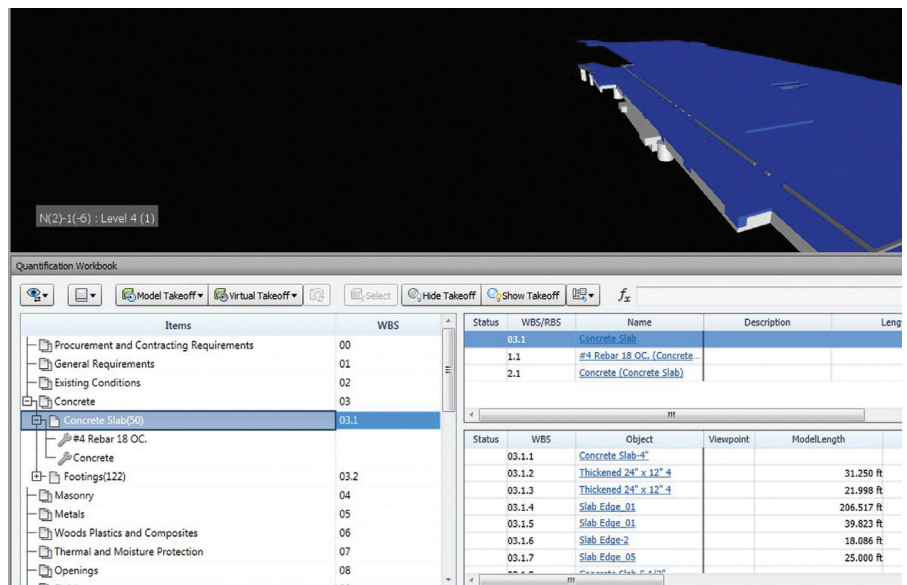


Figure 4: Quantification tool

Navisworks Manage 2014

The Resource catalog is used to create detailed information that can be used to construct assemblies in the Item Catalog. Examples of common resources for a wall are: wall board, coverings, studs, insulation, and so on. In our example with concrete, let's add the resource concrete and the resource 4" Rebar 18" OC.

Once resources are created in the Resource Catalog, you can associate them with an item in the Item Catalog. To associate the catalogs together, select the Item in the Item Catalog, then select the resources in the Resource Catalog, right-click the resources, and select Add to Selected Item.

When you take off model objects, all resources will also be taken off. If you add a resource to an item after you have already associated model objects to the item, these objects will automatically have the additional resource calculated.

DYNAMIC FUNCTION IN CATALOGS

One of the fundamental aspects to the Quantification tool is the ability to create functions in the catalogs to calculate quantities. A good example of this is in the calculations of concrete. If you do a model takeoff on concrete from a model authored in Revit, the calculations are based on cubic feet. When you perform a model takeoff, regardless of the units you select in the catalog, the values will be calculated in cubic feet. In order to properly calculate the volume, you can change the formula from "= ModelVolume " to "= $\text{ModelVolume}/27$ "

When modifying a formula, you can modify the formula to effect only one instance of a takeoff, or you can modify the master to modify all instances of the takeoff. As a best practice, it is suggested you only modify the master for consistency.

ITERATIVE TAKEOFFS

Because the nature of construction documents is iterative, Navisworks allows for your takeoff data to be updated along with the model geometry. When a model is updated, the geometry in Navisworks is automatically updated in the nwcs that comprise the nwf. The quantification tool allows you to view the changes from one iteration of the model to another through the use of the Change Analysis tool. This tool displays multiple different icons to warn you about changes to the model. When model geometry is updated, you are able to view what quantities in the item changed.

For example, if the thickness of a slab changes, the area and perimeter would be the same, but the volume would be changed. You will be able to hover your mouse over the affected cell and view the changes between the old and new versions. You then have the option to accept or reject the changes.

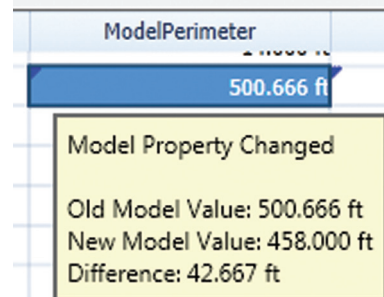


Figure 6: Updating quantities

UPDATED MEASURING TOOLS

The measuring tools in Navisworks have changed dramatically, allowing you to more accurately measure objects. You now have the ability to lock the measuring tools to any xyz plane or surface. This is important because you can ensure you are measuring on the correct plane.

With these measuring tools you can accurately perform takeoffs on objects that are not modeled. For example, if you know there is

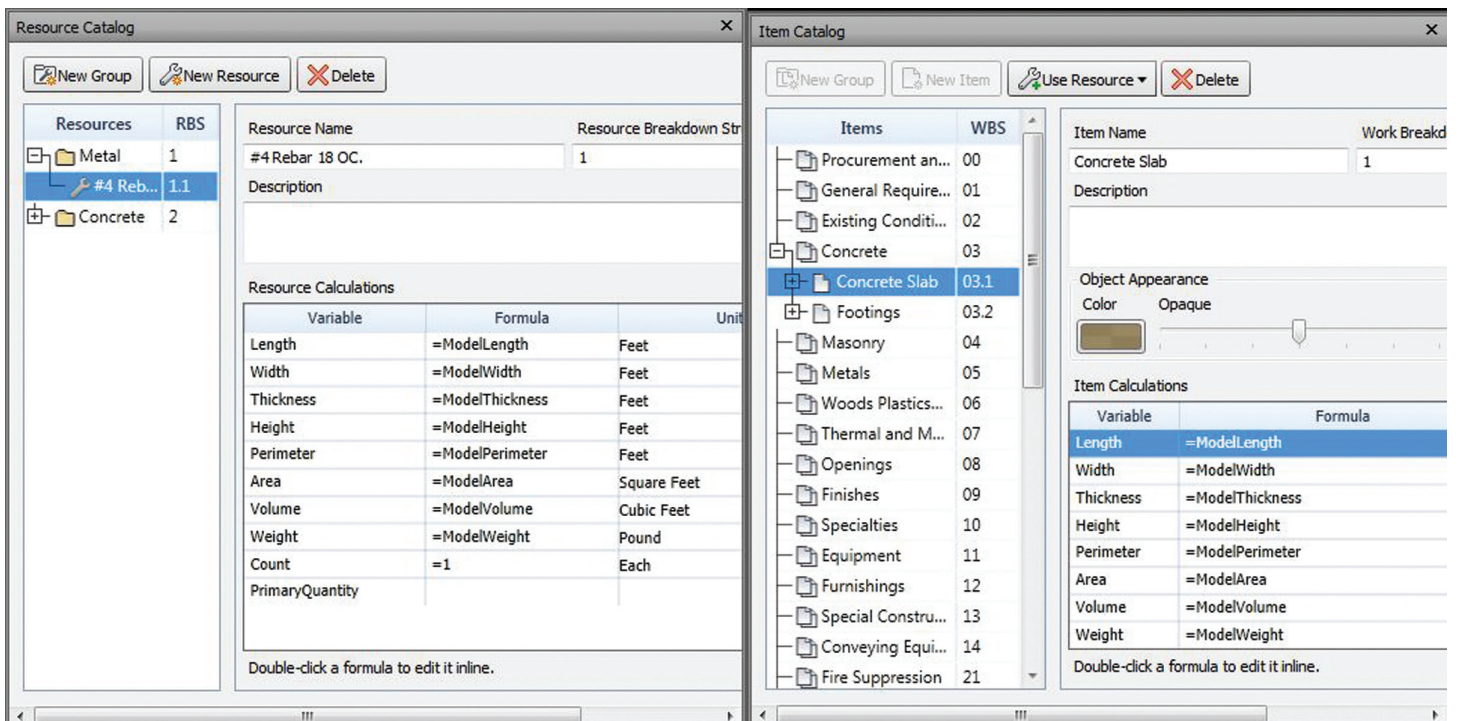


Figure 5: Item and Resource Catalogs

a storm drain missing, you can draw it in with the measuring tools and perform a takeoff on a non-modeled object. When takeoffs are performed on non-modeled objects, the values will not update with model iterations.

LEVERAGING CATALOGS

When you have developed an extensive catalog, you can export it to be used in future projects. Following the example of other tools in Navisworks, this allows you to create a workflow that leverages all your work on one project to another project.

CLASH DETECTIVE CHANGES

The Clash Detective clash algorithm was updated to allow for quicker identification of constructability issues. When multiple clashes are found between the same pair of composite objects, they will be treated as a single clash. Clashes between two parts of the same composite object will not be reported.

Clash item highlight colors have also been updated, allowing you to set the highlight color of clashing items when viewing your clashes.

A new column in the Clash Detective displays the status on the Clash viewpoint. Clash viewpoints can be automatically updated by using the Auto-Update Viewpoint setting, or manually updated by right-clicking on the camera icon, then clicking Save Viewpoint.

Another new column, Comments, has been added to the Clash Detective that displays the number of comments associated with a clash.

The Filter tool has been upgraded to allow you to determine how you wish to filter the selected objects. You can select none, exclusive, or inclusive. Exclusive will show clash results where both of the clashing items are included in your current item selection. Inclusive will show clash results where one or both of the clashing items are included in your current item selection. You can even choose to create reports only on selected items. This feature is in the Include Clashes group on the Reports tab.

The toggle between Dim Other and Hide Other has been restored to the interface in Navisworks 2014. This will significantly improve the workflow, allowing you to more quickly toggle your view controls.

The reporting features of the Clash Detective were also upgraded. The new features allow you to preserve your dim setting in the nwd. This means that users with only Navisworks Freedom will have the ability to view your model with the Dim setting that previously could only be seen in Navisworks Manage with Dim Other selected.

OTHER UPGRADES

The Section tool received an upgrade in this release, allowing you to fit a section box to a selection. This allows you to select a collection of objects and select the Fit To Selection tool to encapsulate the selected objects in a Section Box. This tool can

be used in coordination meetings to quickly isolate the area for conflict resolution.

The update to Timeliner allows you to export Timeliner tasks and save them as a selection set. This means you can manage and perform actions on groups of objects, rather than individual schedule items. Timeliner now also supports Primavera P6 v8.2 data sources.

AUTODESK RECAP

Autodesk ReCap is supported in Navisworks to allow for point clouds to be aggregated quickly and accurately. ReCap has a Windows 8 style with tiles to allow you to navigate all its tools. It is useful software that enables you to import a large variety of point clouds and edit them within ReCap.

One of the key benefits of ReCap is the ability to combine multiple point clouds together, then parse out the combined point cloud into sections that better fit your project. For example, suppose that your laser scanner is set up in multiple points and it requires five scans to view the completed building on a campus. Rather than export the whole campus, in ReCap you can combine the five point cloud files together, then create sections to isolate each building. You can then export just the sectioned building for use in other products such as Autodesk Revit.

This new point cloud software allows you to simplify the way you work with point clouds. Navisworks 2014 will natively read ReCap files, allowing a good workflow between ReCap and Navisworks.



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Focus on Engineering

➡ **M**mmmm, there's nothing like that new software smell in the spring. Every year we ritualistically tear through the new version of Autodesk® Revit® to crown our favorite new abilities and celebrate the Wish List victories made. Much like last year, there are major changes and minor tweaks in the new release. In the case of MEP activities in Revit, the clear trend is incremental growth in BIM while sprinkling in long-awaited Wish List items to help satisfy the Revit foot soldiers on the frontline. The groundwork laid in previous versions allows the 2014 version to stretch even further into design, heavier calculations, and truly leveraging the synced linked data in the architectural and structural models. Let's walk through this year's offerings for MEP users one at a time.

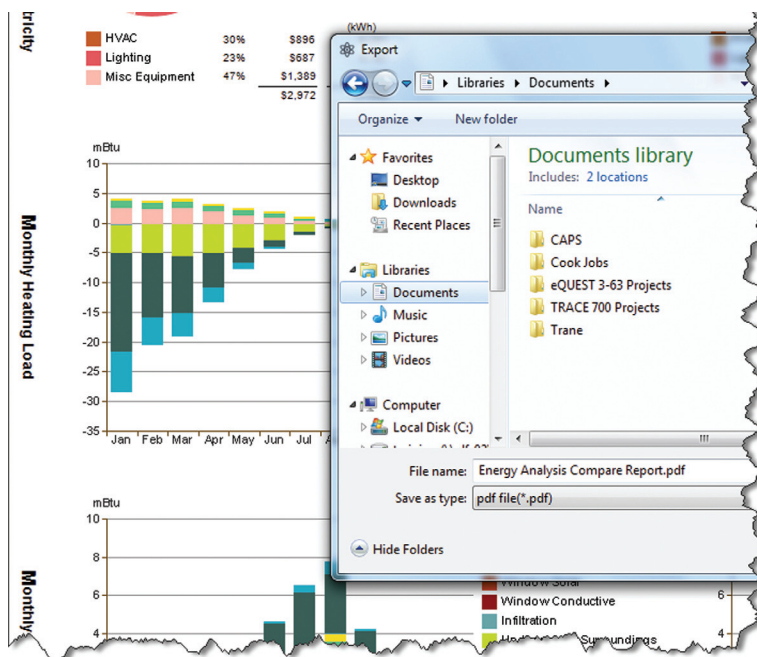
MAJOR UPDATES

AUTODESK 360 ENERGY ANALYSIS

For MEP users, the biggest thing for 2014 has to be the ability to do energy analysis. This is building on the thermal properties that were added in the 2013 release. As a subscription benefit, users can now leverage cloud-based energy analysis tools powered by Autodesk Green Building Studio. This can be done with massing elements and models with or without rooms/spaces. This supports early and often analysis. The procedure is to go to a three-dimensional view and select the 'Use building elements for simulation' tool in the Energy Analysis panel of the Analysis tab of the ribbon. The Energy Setting dialog appears. Users have the ability to specify material thermal properties or building constructions can be used. If spaces are present, the space data will be included in the analysis. Once the user is satisfied with the energy settings, the energy simulations can be run or rerun. The amount of time the analysis takes

depends on the size and complexity of the model. Revit will inform the user when the analysis is complete. Results can be exported to gbxml, DOE2, or EnergyPlus formats using the Results and Compare tool.

It is important to remember that this is the first release with this capability and there will doubtlessly be tweaks and improvements in the future. In the meantime, remember: garbage in, garbage out. Models with missing floors, ceilings, and gaps between elements will pervert the results. Be aware that two walls that are directly adjacent like bread in a sandwich will result in no wall if the gap between is approximately 1½" to 3".



OK, onto the soapbox.

If there was ever an HVAC reason to model, here it is. Face it, this will change the way calculations are done and for the better. It might take some time, but someday it will be clear that the game changed in the 2014 release.

Stepping off.

NON-RECTANGULAR CROP REGIONS

This is not necessarily an MEP thing, but what a difference maker and so long awaited. Cut out any shape for plans, elevations, section crop regions, detail callout views, and section callout views as long as the shape contains only straight lines. On the downside, column lines and scope box regions don't provide the ability to create irregular shapes. It's hard to complain much when a seven-year-old wish finally gets answered, even if annotation crop remains rectangular.

CSV DATA EMBEDDED IN FAMILIES

This feature eliminates the need for external CSV files to be linked to MEP families. A new Lookup Tables Manage button in the Family Types window allows users to import, export, and delete lookup tables related to the family. The thought here is that piping and conduit families become more transportable and their management more centralized.

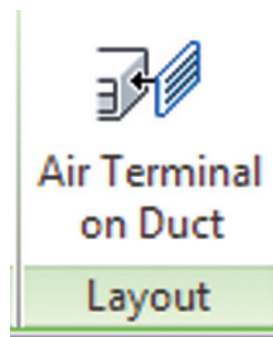
NICE UPGRADES

DIVIDE SYSTEMS

The Divide System tool is available in the Modify|Duct System contextual tab of the ribbon. Use it to divide systems that are not physically connected. This helps keep system sizes at a manageable level, but it must be done before there is a physical connection made between the system's parts.

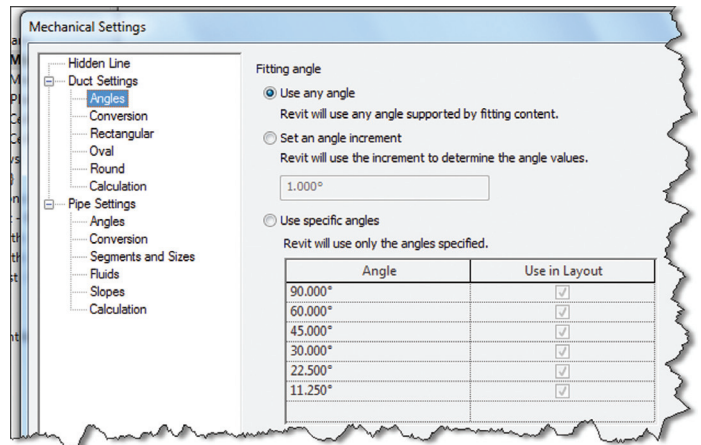
AIR TERMINAL ON DUCT

The reality is that air terminals get placed directly on ductwork. It hasn't been easy to accomplish this in Revit. The Air Terminal on Duct tool can be used to attach terminals to rectangular, oval, and round duct and still propagate CFM through the system. Terminals that are attached to a duct segment can be copied along the segment at will. Currently, face-based terminals are not supported. Since face-based terminals are pretty common, creating terminals for the express reason of attaching directly to duct is encouraged.



USE SPECIFIC ANGLES

Embedded into the Mechanical and Electrical Settings dialogs is the ability to restrict the available angles used when adding or modifying pipe, duct, conduit, and cable tray. When enabled, the user can set an angle increment to apply. When in use, the preview angle is misleading as the placed entities will conform to the closest available angle while the preview doesn't. This parameter will not



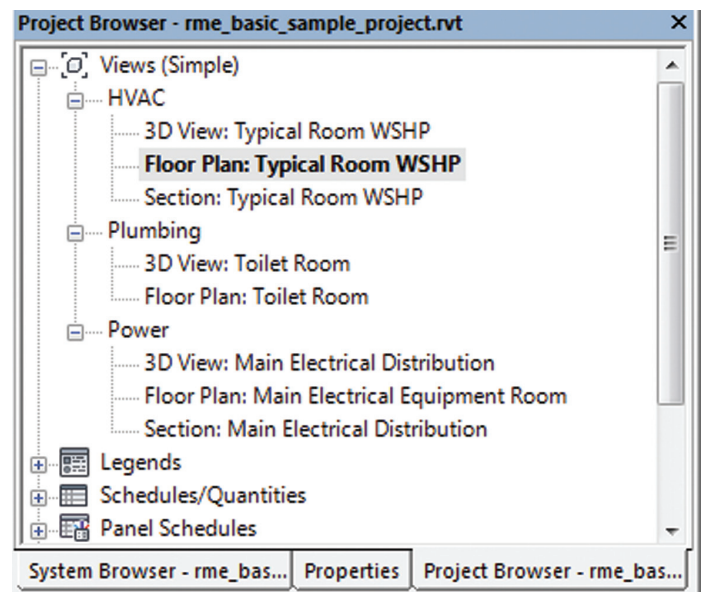
apply to elbows when entities are dragged to maintain connectivity. Similarly sloped connections and objects that have their type changed may be slightly off angle to accommodate the changes without breaking the system.

IMPROVEMENTS TO WORKING WITH MATERIALS

The Materials browser has been updated to allow for easier navigation of project-based and library-based materials. Materials now have a property called Class, which can be used to easily group or sort materials by the users' needs. The Materials browser and editor have been merged into a single dialog to facilitate usability.

DOCKABLE WINDOW FRAMEWORK

For anyone with monitor envy—this is, people with one monitor or small monitors—Revit now offers the ability to combine the Project Browser, the properties Palette, the System Browser, and the Reconcile Hosting Browser in a single combined and tabbed dockable window. The individual palettes can be dragged by their title bars in and out of the combined palette.



Revit MEP 2014

SCHEDULE UPDATES

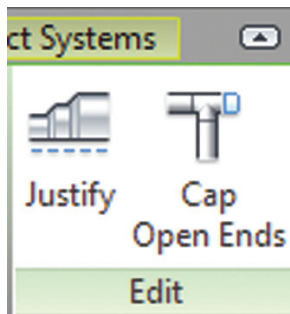
Schedules now have a contextual ribbon full of tools for editing including the ability to add embedded images. This helps simplify dealing with schedules.

There are also some new categories that can be scheduled. Flying under the radar is the Level category. This sounds like the ticket to finally be able to quantify objects by level without a lot of Revit gymnastics.

LITTLE TWEAKS

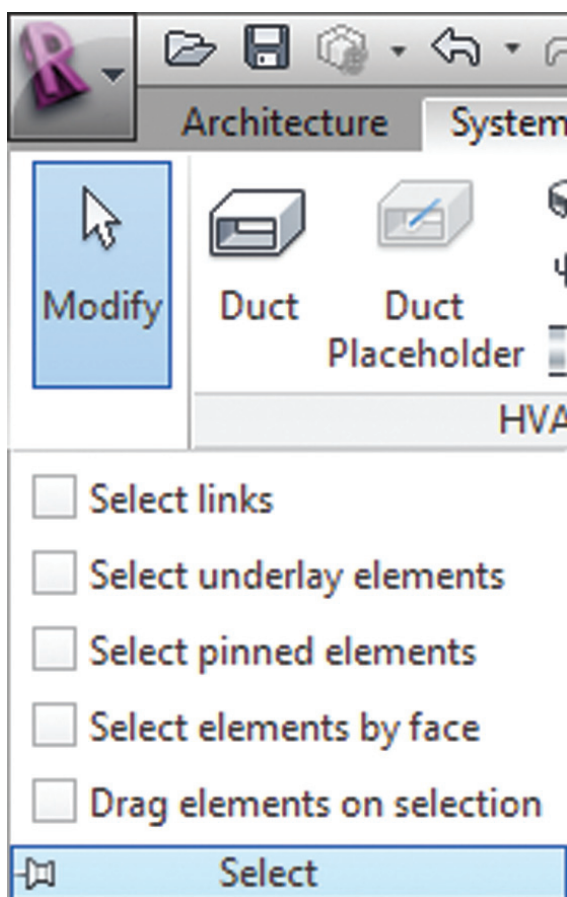
CAP OPEN ENDS

The Cap Open Ends tool has been added to both the duct and pipe contextual tabs. As expected, it will add a cap to open ends of selected duct and pipe when invoked. It has also been added to the Connectors right-click menu, which is quite handy for closing ends on the fly.



SELECTION ENHANCEMENTS

Tired of the accidentally moved or selected linked model, even when pinned? Problem solved—just deselect the Links, underlay, or pinned elements to exclude them from being selected. Also in the list is select elements by face. The drag elements on selection check box has been moved into this part of the interface as well. The interface makes total sense and takes zero training to understand. Well done—5 for 5.



DOUBLE-CLICK TO EDIT

Here is a no-brainer. Most items that have this ability are architectural in nature, but there are a few general ones that should make a real difference to MEP designers. Favorites include the ability to double-click on schedules and views on a sheet and open them for edit. When revision clouds are double-clicked, Revit will now go directly into sketch mode. And when building families, double-clicking on forms such as extrusions and blends will put Revit into Edit form mode. To edit the double-click actions, select the Double-Click options tool found in the User Interface tab of the Options dialog.

APPARENT FIXES AND SIDE EFFECTS

MOVING CIRCUITED DEVICES AND PANELS

The previous release came with the unfortunate feature of locking down panels and devices after a certain number of devices were circuited to a panel. The result was the inability to rehost devices and panels without extreme measures. Limited testing is showing that this may be fixed in the 2014 release. This should come as a great relief to electrical users.

DISPLACE ELEMENTS TOOL

This tool's intended purpose is to create exploded architectural views. The side effect may be that plumbing risers can more easily be created from locked 3D views. It takes a bit of experimentation, but the ability to push and pull elements in a selected view may have more uses than originally thought.

CONCLUSION

There was a time when the MEP flavors of Revit were considered not quite ready for prime time, but it seems those days are behind us. There is more fit and finish activity than new capabilities when it comes to MEP in Revit. Electrical users may be disappointed in the apparent lack of any true electrical progress and the same may also be said for mechanical. While there is plenty of room to grow, this release exemplifies Revit's continuing evolution to a much more complex engineering tool. At the same time, improvements to Revit's base ability to draft are still being added and modified. It is well worth the upgrade—not just for compatibility with architectural project files, but also to exploit the engineering capability it offers.



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SketchFab<http://sketchfab.com/>

Sketchfab is a web service that allows you to publish 3D content in real time online, without a plug-in. According to Sketchfab, "The world we live in is in 3D, but the web is still in 2D, and we want to change that. We think your 3D models deserve something better than screenshots or 'showreel' videos. That's why we created Sketchfab. We understand 3D and bring it to the web. Take a look at our intro video below to learn more."

Sketchfab utilizes custom exporters to make using the service as easy as possible. There are exporters available for Autodesk 3ds Max®, Autodesk® Maya®, and other 3D modeling software. Even without an exporter, you can still utilize the service by uploading one of 27 different supported file formats.

 A person in a dark pinstripe suit and blue shirt is holding a white sign with the words "Inside Track" in a large, bold, blue font.

Inside
Track

**AUGIWorld
brings
you recent
developments
in Autodesk
and AEC-
related
software
items**

MakerBot Digitizer<http://store.makerbot.com/digitizer.html>

MakerBot has been on a mission to democratize 3D printing and make it affordable for everyone. The desire to personalize everyday devices and items is on the rise over the past few years, from custom cases for cell phones to jewelry. At this year's SXSW, MakerBot announced their Digitizer Desktop 3D Scanner.



"The MakerBot Digitizer Desktop 3D Scanner is a quick and easy way to turn the things in your world into 3D designs you can share and print."

SSMPropEditor 5.0<http://www.jtbworld.com/SSMPropEditor.htm>

SSMPropEditor is the Sheet Set Manager Properties Editor for AutoCAD®-based products. SSMPropEditor 5.0 is now available and comes with the addition of localization for Italian, direct export and import to and from Excel, and more.

Edit properties on multiple sheets belonging to AutoCAD's Sheet Set Manager (SSM) or AutoCAD Architecture's Project Navigator (PN) Sheet Set View with ease. If you want to change properties such as a revision, date, or name on two or more sheets at the same time, SSMPropEditor is for you. Your productivity will increase and you will save time avoiding a lot of manual work.

Until next issue!

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



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