AUGIWorld

The Official Publication of Autodesk User Group International

April 2017

Taking the Lead: Managing Standards, Staff, and Processes

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Letter from the President

I don't know about you, but when I graduated from college, the idea of "management" wasn't anywhere on my radar. I was going to go design buildings. Sure, that would involve being part of a team. But running that team? That was for somebody else.

Funny thing, though…as you gain experience at a firm and in an industry, sometimes you become that "somebody else." A management role can sneak up on you if you're not paying attention, until you look around one day and realize you're in charge.

I suspect that the "accidental" management path is especially common among CAD Managers. Many of us more or less evolved into our role, rather than seeking it out on purpose. What starts one day as an interest in software, or an awareness of drafting or modeling inefficiencies, can quickly grow into a leadership opportunity.

That kind of improvisation can be beneficial in the sense that it matches up talent with need. But it can also mean that many of us are learning management skills on the fly, so to speak. And of course there are many different types of management: CAD and BIM leaders often need to be able to manage people and projects in addition to CAD or BIM standards.

I'll come back to people management in a future letter, but today I'm thinking about project management. Whether it's taking a building through various design stages, implementing a new office standard, or deploying a new software package, I bet we all have "project management" tasks from time to time. And the first step of any project is—or should be—a plan.

Planning is easy for some of us, harder for others. What kind of planner are you? Are you a mosaicist or a painter?

If you haven't heard that analogy before, I'm not surprised. (I made it up.) Let me explain.

When you're building a mosaic, you start with lots of little pieces of tile and put them together into a larger work of art. For a painting, you make a sketch on the canvas, then apply broad washes of color, and finally fill in the details.

Both types have an end result in mind when they begin, and they might end up with similar pictures, but their process is totally different.

If you have a large project to tackle, which approach do you use? Do you assemble all your bits and pieces and use them to structure your plan? Or do you draft the overall goal and then break it down into discrete tasks?

I don't think either method is necessarily superior to the other. Either can be deployed effectively as long as there's thought behind it. But I do think it would be time well spent to analyze your own preferences and tendencies, and see if there are elements of the other method that you can incorporate into your own workflow.

Anything we can do to actively advance our skills as managers—whatever type of management we're responsible for—will benefit everyone in the long run.

Happy planning!

Kate Morrical
AUGI President

Wall Management and Coordination

SET THE GROUND RULES

In a perfectly executed project, all disciplines meet early on and define who owns what portion of the BIM model. We all know that seldom happens and more often than not there are deadlines and budget constraints that dramatically affect the project workflow. The key for any discipline is to develop workflows and procedures that help when collaborating with other disciplines. In this article we will take a look at using filters and the Copy/Monitor tool to help manage walls inside your Autodesk® Revit® Structure model.

UNDERSTANDING SOME VISIBILITY BASICS

Walls have a property that determines their structural usage. The combination of the structural usage and the discipline of the view determines whether or not a wall is even displayed. For example, when you link in a Revit Architectural model from a consultant only to find out none of the walls are visible in your plan view. The reason, most likely, is that the architectural firm did not bother
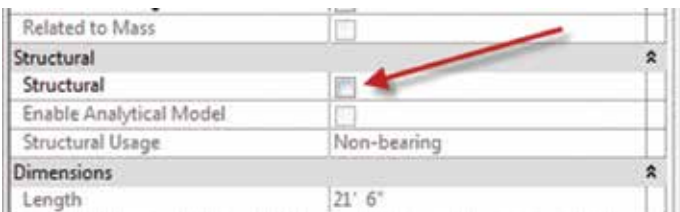
Figure 1: Structural usage of wall property
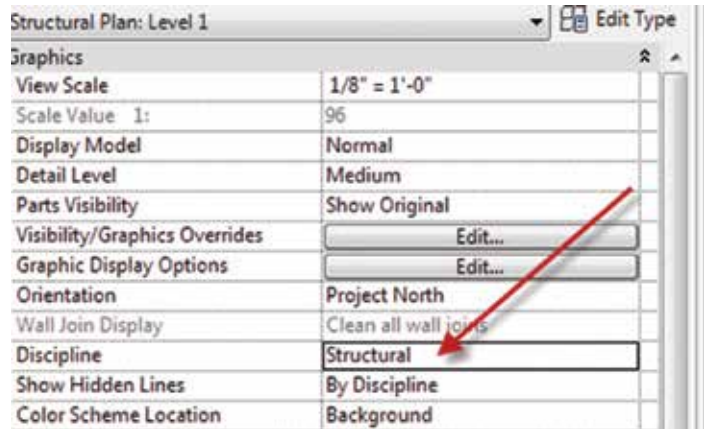
Figure 2: View discipline

to assign any structural usage for the walls, and the discipline of your view is set to Structural. You can confirm this by setting the discipline of your view to Coordination to have your walls magically appear.

PARTS VERSUS COPY/MONITOR

The structural engineer couldn't care less about the finishes on a wall and is only concerned with the core or structural component of a wall. With that said, there are a couple options that people explore to solve this problem. You could request the architect to convert the walls into parts and set up a view that has the visibility of the finishes turned off and only the structural core left on.

There are a couple of issues with this workflow. The first is the additional work this will cause the architect, the second is that these walls are in the Architectural model when the end goal is to have them reside in the Structural model for analysis.
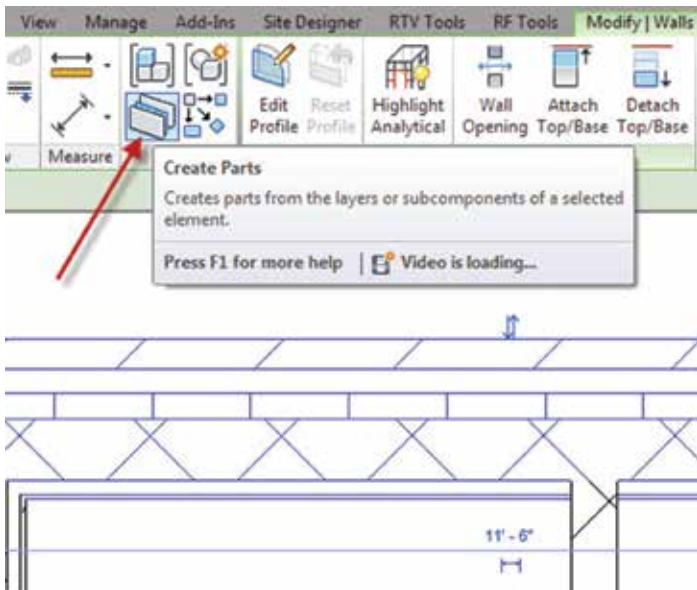
Figure 3: Create parts

Using the Copy/Monitor tool, the structural engineer can copy the walls from the Arch model into the Structural model, which creates a relationship between the two instances of the wall in case there is a change.

Figure 4 shows the wall linked in from the Architectural model. Also, there are two annotation lines showing the core boundary of the wall. When using the Copy/Monitor tool, make sure you substitute the appropriate wall type to replace the architectural wall type you are copying. Also verify your location line alignment so your structural wall is in the correct place, matching the wall from the Architectural model.
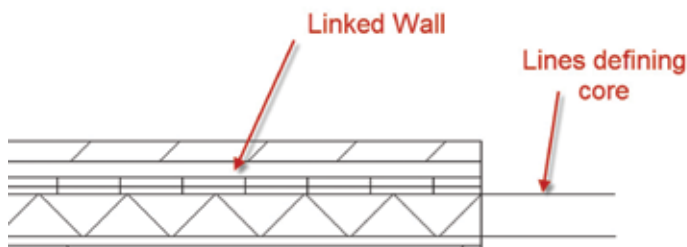
Figure 4: Architectural linked wall

Figure 6 shows the resulting wall highlighted, which is now coordinated with the Architectural model. This allows the Structural model to have a wall present in the model that can be assigned structural properties and to stay coordinated with the wall in the Architectural model. If the architectural wall moves, there will be a coordination error that prompts for a review.
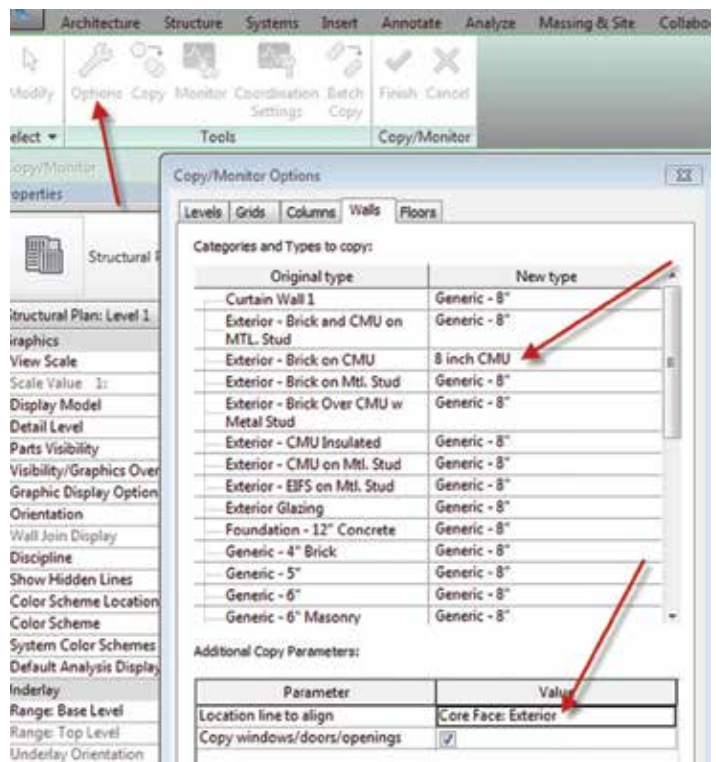
Figure 5: Copy/Monitor options
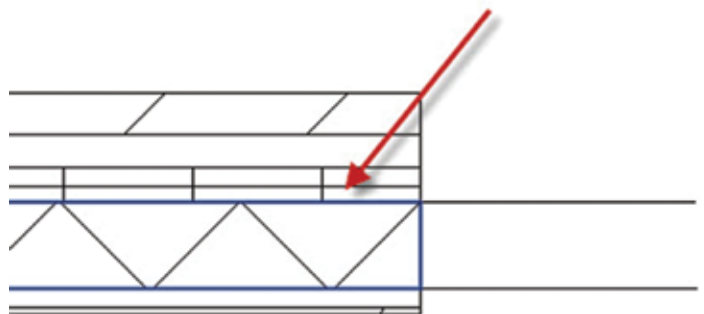
Figure 6: Coordinated walls

The key for any discipline is to develop workflows and procedures that help when collaborating with other disciplines.

Revit 2017 – Structure
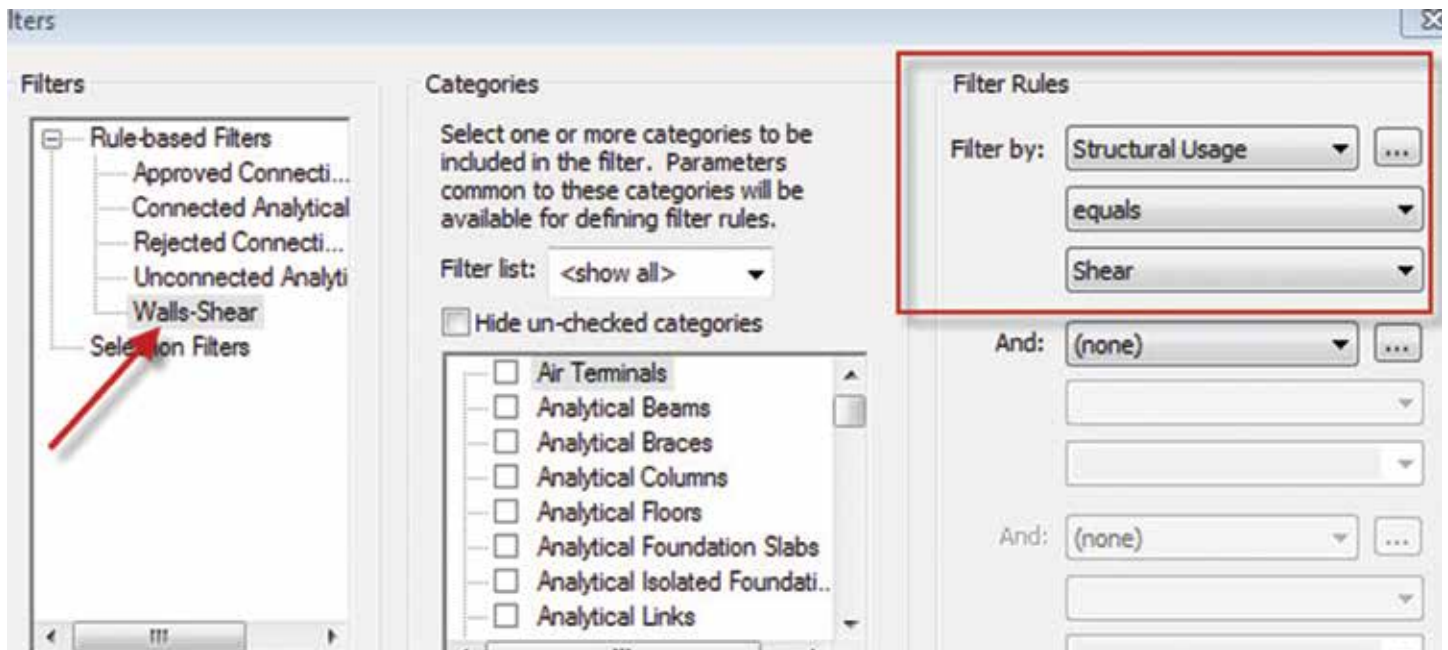
Figure 7: Shear wall filter

Figure 8: Structural filters

STRUCTURAL USAGE FILTERS

The use of filters outside of Revit MEP is rare. A view worth creating in your Revit structure model is one with filters applied that highlight the structural usage of your walls. Figure 7 shows the settings for a filter that looks for walls with the structural usage set to shear.

You can duplicate your floor plan views and rename them, adding "Structural filter" as a suffix and apply a filter for each structural usage type.

This allows you to have a graphical representation of the wall structural usage at a glance without querying walls in your model. Figure 9 shows all the filters applied. This is a useful step before exporting your model into analytical software, assuring the engineer that the structural usage of the walls is correct.

SUMMARY

Hopefully some of these tips will help you better manage the walls in your Structural model.

Philip Russo began with AutoCAD version 2.5 in 1986. Through the years he has held positions in the CAD industry including CAD Draftsmen, CAD Manager, Sr. Applications Engineer, and is a Certified Autodesk Instructor. For several years Philip was the Revit Structure content manager and author for AUGIWorld magazine. Philip currently has a seat on the board of Directors for AUGI. He has previously spoken at Autodesk University and bimWORKSHOPS. Lately Philip's focus has been on the implementation of BIM Workflows and standard practices. He currently holds the position of Corporate BIM Applications Manager at O'Brien & Gere Limited, a multi-disciplinary engineering firm located in Syracuse, New York. Philip can be reached at phil.russo@obg.com

Figure 9: Structural filters applied

Most Buildings Sit On The Ground

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by Robert Green

HP ZBook 15u G4 – Ultrabook Performance at Entry Level Price

Thin, light and reliable with great battery life – that's what HP Mobile Workstation Ultrabook™ devices deliver. But getting an Ultrabook™ with enough power to run CAD tools for the average CAD user must be too expensive for the IT budget, right? Not with the new HP ZBook 15u. Billed as an entry class Ultrabook™[1], the HP ZBook 15u leverages the latest Intel® Core™ i5/i7 dual core processors, RAM and SSD technology to create a no frills mobile CAD workhorse machine starting at $1029.

Figure 1 – The HP ZBook 15u is thin, light and powerful with a 15.6" diagonal screen.

THE SPECS

The HP ZBook 15u is a 15.6" diagonal screen form factor machine with Ultrabook™ thin/light measurements of 19.9mm/0.72" and starting at 4.18lbs* in its base configuration.

But despite its compact size and price point, the HP ZBook 15u delivers the latest technologies and components to yield a variety of no-compromises CAD configurations.

Let's start with the major system components:

+ 7th Gen Intel® Core™ processors
+ Up to 32GB 2133 MT/s DDR4 memory
+ 256GB to 1TB available HP Z Turbo Drive G2 PCIe solid state discs (SSD's)[3]
+ 500GB to 1TB conventional Hard Drives[3]
+ 2TB maximum total storage (including 1TB Z Turbo Drive & 1TB conventional hard drive)
+ Integrated: Intel® HD graphics 620
+ Discrete: AMD FirePro™ W4190M with 2GB GDDR5 GPU
+ Windows 10 Pro operating system.

The 7th Gen Intel® Core™ i5/i7 processors provide high clock rates via a dual core[2] system architecture that reduces processor power consumption substantially. By providing fast processing the 7th Gen Intel® Core™ lower power consumption architecture allows the HP ZBook 15u to reduce thermal management challenges inside the case – all meaning that it can run cool while still fitting a full complement of storage, memory and graphics devices.

For mainstream Autodesk applications, these specifications provide the fast clock rates, ample memory and fast Z Turbo Drive G2 SSD based I/O (over 4X faster than conventional SATA SSD's) that speeds CAD processing. And with the discrete 2GB graphics, all but the most demanding 3D modelling workflows are well supported. Most Autodesk users would be happy to have a desktop workstation machine meeting these specs at the office.

OTHER USEFUL OPTIONS

Beyond the powerful basic specs, the HP ZBook 15u has some other available options that allow you to customize it to suit your workload requirements. A few of these features to note:

Available FHD, FHD Touch and 4K screen options. Supporting full HD[6] (1920x1080) in conventional or touch screen

modes along with a conventional 4K (3840x2160) screen option along with a DisplayPort 1.2 connector, dual monitor configurations[4] at a variety of resolutions can be used to support typical CAD workflows.

Rapid charge 51Whr battery. In addition to providing Ultrabook™ class battery performance the HP fast charging battery system allows up to 50% recharge rates in just 30 minutes for quick charges on the go.[7]

Exchange data rapidly with typical field devices. Multiple interface ports, including a USB 3.1 Gen 1 port, smart card and SD media card readers make loading/offloading data to/from the HP ZBook 15u G4 quick for a variety of devices CAD users encounter most often in the field.

Connecting in the field. Unlike many other Ultrabook™ devices that have removed connectors from their designs the HP ZBook 15u still includes a wired RJ-45 network connector and a legacy VGA port. If you've ever had to plug into an old VGA projector in a hotel conference room or connect to a non-WiFi enabled network at a construction site, you can appreciate these features.

RELIABILITY

Though compact and inexpensive the HP ZBook 15u doesn't cut any corners in terms of reliability or warranty coverage. Like all HP Mobile Workstations, the HP ZBook 15u G4 undergoes HP's Total Test Process that submits it to 120,000 hours of total system testing which, when combined with HP standard features, provides the following assurances:

ISV Certification. Independent software vendor certification assures that the HP ZBook 15u G4 runs industry standard software packages reliably without driver or hardware conflicts.

Expanded MIL-STD testing. The punishing MIL STD 810-G specification exposes the HP ZBook 15u G4 to extremes in temperature, humidity, altitude and repeated drop tests.[8]

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

Warranty. Parts, labor and on site coverage for a full three (3) years.[9]

Security. The HP ZBook 15u G4 offers key security features such as a smart card reader, fingerprint reader, storage drive encryption methods and HP Sure Start Gen 3. Sure Start Gen 3 assures that the machine starts with a genuine HP BIOS every time, monitors in-memory BIOS, recovers the platform without user or admin intervention, restores the BIOS to a custom state, and is enterprise ready for centralized management[10].

NO SACRIFICE FOR MOBILE CAD

With more flexible office environments, job site visits, remote office work assignments and general business travel the environment for CAD work is not necessarily at a fixed desktop in the office. The ability to "throw your workstation in a bag" and travel is more and more the reality for many CAD workers now. In the past travelling workers typically had to go through an elaborate process when they travelled:

⬩ Sync their desktop machine to a lower powered laptop

⬩ Struggle through the remote assignment with less power than desired.

⬩ Sync back to their desktop machines upon return.

Using an affordable CAD enabled Ultrabook™ like the HP ZBook 15u means the CAD user has a single, powerful machine that actually is their desktop so they can work at full power while travelling as the hassle of syncing desktop and mobile machines simply goes away.

WRAPPING UP

As mobility of the workforce becomes more the norm, Autodesk users will increasingly need powerful mobile workstations that can run their software efficiently while not costing a fortune. Entry level Ultrabook™ workstations like the HP ZBook 15u are up to the challenge by providing cutting edge technology combined with classic HP reliability and performance.

ABOUT HP

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

ABOUT ROBERT GREEN

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

by: Melinda Heavrin

Working with Sections

A section represents a building model as if the model were cut vertically or horizontally to show interior detail. You can create two-dimensional (2D) or three-dimensional (3D) section objects or a live section view of the model. You can control the size and shape of the section you generate and assign materials to the section for an optimal visual representation of the sectioned objects. Section objects remain linked to the building model that you used to create them, unless you explode the section. Because of this link between the section and the building model, any changes to the building model can be reflected in the section as well.

The auction line defines the arxtents of the section that you extract from the building model. Sections lines can be straight or jogged. You can also specify the length, depth and height of the area defined by the section line. Section marks appear at each end of the section line. It is important to note that by default, the height of the section line is the extent or height of the model. If you wish to change the height, select the section line, and in the Properties palette change the value of "Use Model Extents for Height" to "No." After you draw the section line, you can create a section object or a live section view from the line.

2D sections are created by cutting a number of objects with a section line and then creating a 2D section object from them. The section object is drawn without hidden and overlapping lines. You can edit a 2D section by changing its object display properties or its style display properties. The 2D section style lets you add display components to the display representation of the section and create rules that assign different parts of the section to different display components. You can control the visibility, layer, color, linetype,
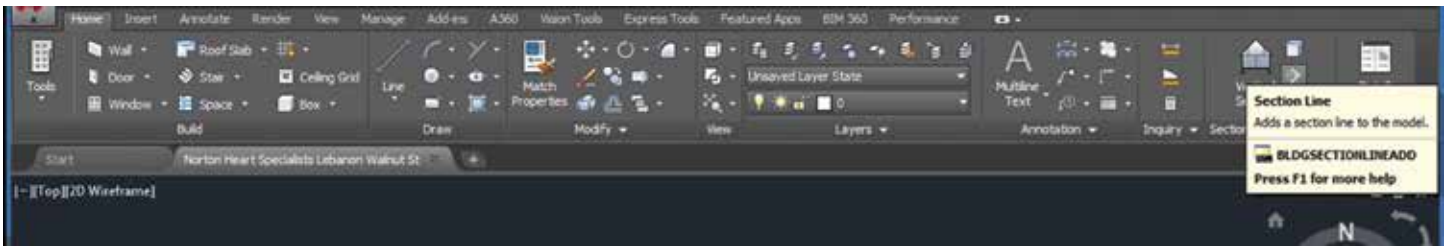
Figure 1: Section line

lineweight, and linetype scale of each component. You can also choose whether materials, such as brick or concrete hatches, are used to display individual components of the section object or the 2D section style. Furthermore, you can use linework editing commands to assign individual lines in a 2D section to different display components and merge geometry into a 2D section. You can dimension 2D sections.

3D sections are created by cutting a number of objects with a section line and then creating a 3D isometric section object from them. 3D sections do not use styles. However, you can control the display of subdivisions within 3D sections. Using the Hidden Line Projection command, you can create 2D hidden line projections of any view of the 3D section that you can explode and edit or hatch.

A live section view is a special view of a 3D section where the objects that are sectioned are not converted to a 3D section object. Instead, the existing model objects are displayed as a 3D section. The parts of the objects within the bounding box of the section line keep their individual display components while the parts of the objects outside of the section line can optionally be displayed or hidden. To control the appearance of the object parts outside of the section line, you need to assign a material to the sectioned objects. When you render a live section, you can show the outside part as a half-transparent addition, for example.

DRAWING AND EDITING SECTION LINES

The first step in creating a section is to draw a section line through the building model (see Figure 1). The section line defines the extents of the section to extract from the building model. Section lines are bidirectional and you can specify the length and depth of the section line either visually using the pointing device, or by entering numeric values. By default, the section line height is as high as the model. If you wish to change the height, select the section line and, in the Properties palette, change the value of "Use Model Extents for Height" to "No."

When you generate a section from a section line, you specify the type of section object that is created. When you create a 2D section object, the result is an orthographic projection from the building model. When you create a 3D section object or a live section, the result is the area of the building model defined in the section line. When you create a live section view from a section line, you do not create a new section object, but instead switch to a special view of the 3D building model. You do not select objects to include in the section; the live section view includes all objects in the drawing. The section line controls how objects are displayed in a live section view. Objects or parts of objects that are within the bounding box of the section line retain their original display properties. Objects or parts of objects that are outside of the section line are either not displayed at all or are displayed with a special display component for the sectioned body.

In plan view, the section line is displayed as you would expect on a construction document. The section marks point in the direction that the section is cut. In an isometric view, the same section line is displayed with a boundary that defines the extents of the section. You can change the section line to control the section that you create. Using the section line, you can change the height and shape of the section. You can also add a lower extension to the section and create section subdivisions. You can change section line and section line segment properties before or after you generate a section. After changing section line properties, you can apply the changes to a section that you previously created with the section line.

AutoCAD Architecture 2017

CREATING A SECTION

After you draw a section line, you extract a section from the section line and the objects you select in the building model. Before you create a section, it is a good idea to thaw and turn on all layers containing objects that you want to include in the section. Objects on layers that are off or frozen cannot be part of the selection set for the section. To enhance performance, turn off the layers of the objects that you do not need to include in the section. If you want to insert a 2D section in a plan view, make sure that the display set used for the plan view does not section objects by display range. In that case, the section result would not be displayed in the plan view. To make sure that this is not the case, click the Manage tab on the ribbon, Style & Display panel, Display Manager. Select the Plan display set for the currently used display configuration. On the Display Options tab, verify that Section AEC Objects by Display Range defined in Display Configuration is cleared (see Figure 2).

To create a new section, draw a section line in the drawing. Select the section line and click the Building Section Line tab, Modify panel, Generate Section (see Figure 3). Now select the type of section object you want to create. If you want to create a 2D section, then select 2D Section/Elevation Object with Hidden Line Removal. If you want to create a 3D section, then select 3D Section/Elevation Object. If you want to use a particular style, select it from Style to Generate. Otherwise, use the Standard style. 3D sections do not use styles.

Under Selection Set, click Select Objects and select the objects that you want to include in the section. Press Enter when you finish selecting objects. It is important to note that if you select an object that you do not want to include in the section, hold down Shift and select the object again to remove it from the selection set.

Under Display Set, select a display set for the section object. The display set controls the representation of the section. Under Placement, select New Object and specify where to place the section. If you want to specify a location graphically, then click Pick Point and specify the location for the new section object in the drawing. If you want to specify the coordinates of the insertion point for the section, then enter X, Y, and Z coordinates for the location of the new section object. Click OK.

A 2D or 3D section is created from the section line properties and the selected objects in the building model. The section is linked to the building model. If you make changes to the building model
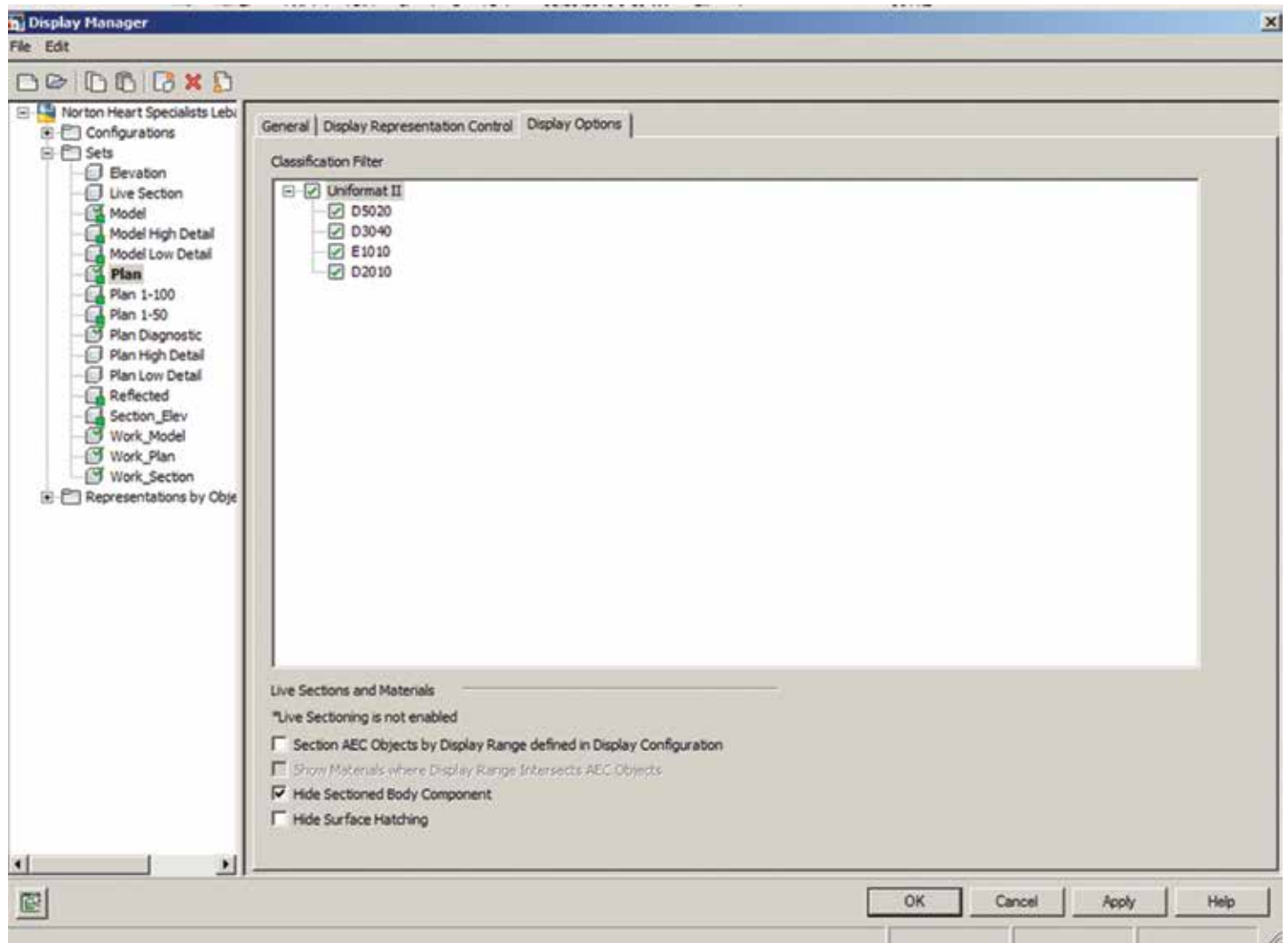

Figure 2: Section plan view

after you create the section, you can update the section to reflect the changes. You can edit certain characteristics of the section to control its placement and appearance. You can also use a 2D section style to control the display of selected objects in a 2D section and you can control the display of individual lines in a 2D section.

Figure 3: Generate Section

UPDATING A SECTION

You can update a 2D or 3D section to reflect changes you have made to the building model or to section line properties. For 2D sections, you also update the section to show changes made to the 2D section style. You can update a 2D or 3D section if you have not exploded the section, which destroys the link between the section and the building model. When you update a section, you can add or remove objects from the section, change the location of the section in the drawing, and change the display set of the section.

If you do not need to change the section definition in any way, you can skip the following procedure. Instead, select the section you want to update and click 2D Section/Elevation tab, Modify panel, (or right click) Refresh (see Figure 4). Select the section you want to update. If you selected a 2D section object, then click 2D Section/Elevation tab, Modify panel, Regenerate.

If you selected a 3D section object, then click 3D Section/Elevation tab, Modify panel, Regenerate. If the section is a 2D section object, then select 2D Section/Elevation Object with Hidden Line Removal. If the section is a 3D section object, then select 3D Section/Elevation Object. To change the style of a 2D section, select a new style for Style to Generate.

If you edited linework in the 2D section, select a style in which to save the changes you made that cannot be reapplied. Choose a style that will distinguish the unapplied changes in the section. Under Selection Set, specify the objects that you want to include in the section.

If you want to use the objects in the selection set you specified when you created the section or when you previously updated it, then proceed to the Display Set. If you want to add new objects to the selection set that you specified when you created the original section, then click Select Additional Objects, select the new objects in the drawing, and press Enter.

If you want to select a new selection set of objects for the section, then click Reselect Objects, select a new selection set of objects for the section, and press Enter. Under Display Set, select a display set for the section. Under Placement, locate the section in the drawing. If you want to create a new section object without overwriting the original object, then select New Object and either specify an insertion point in the drawing area or enter X, Y, and Z coordinates for the new section. If you want to replace the original section with the updated section, then select Replace Existing. Finally, click OK.

Figure 4: Refresh Section

LIVE SECTION VIEWS

A live section view is a special view of a 3D model section that is always applied to all objects in the drawing. Unlike a 2D or 3D section, you do not choose a selection set of objects to be contained in the section. All objects are contained in the live section view. Their display properties are determined by whether or not they are situated within the bounding box of the section line. The objects contained in the live section view are not converted into a section object, but are retained as objects in the drawing. They keep all of their properties and display components and can be edited. The area of objects that lie outside of the section line or objects that lie completely outside of the section line can be displayed or hidden.

AutoCAD Architecture 2017

Figure 5: Live Section view

The appearance of these objects and of parts of objects outside of the section line is controlled by the Sectioned Body component.

When you render a live section, you can show the outside part as a half-transparent addition, for example. The live section view can be turned on and off in a drawing. It is important to note that when a live section view contained in a project view drawing is dragged onto a project sheet, and the live section view should be displayed in the sheet view, the external reference of the view needs to be selected in the sheet, and have a display configuration override applied to it.

To create a live section view of your building model, draw a section line through the building model. Switch to a 3D view, such as SW Isometric. Select the section line and click Building Section Line tab, Live Section panel, Enable Live Section.

When you create a live section view, the sectioned objects are not converted into a section object. Instead, the objects remain in the drawing. The objects and object areas that are inside the section line retain their previous display properties. A brick wall inside a section line retains its brick pattern and its dark red linework. The objects and object areas outside of the section line change their display properties because they are now placed on the Sectioned Body display component and use its display properties. The live section updates interactively when you change the objects associated with it. If you drag a wall outside of the section line, the wall uses the display properties of the Sectioned Body component. If you drag a wall inside the section line, the wall uses its own display properties. When you change the material assignment of an object in a live section view, the new material is automatically used in the live section.

Whether objects and areas of objects outside the section line are displayed in the live section view depends on the material settings for each object and object style. The sectioned objects inside the section are displayed with their regular display components and material assignments. Objects or object parts that are outside the section are displayed differently. You can either hide them completely or display them on the Sectioned Body display component.

The Sectioned Body display component is specified in the material assigned to the object. The sectioned body is often displayed in a lighter, half-transparent color or as dotted linework. In a material definition, the Sectioned Body and Sectioned Boundary display components influence the display of the live section view. The Sectioned Body includes the objects or object parts outside of the section line. The Sectioned Boundary is the cut line created by the section line. To begin, select the object for which you want to display the sectioned body, right-click, and click Edit Object Display. Click the Materials tab and select the material definition you want to change, then click Edit Material. Select the display representation of the material and click Edit Display Properties. Click the Layer/Color/Linetype tab. Change the display of the sectioned body and sectioned boundary. If you want to hide the sectioned body, then set Visible "off" for the Sectioned Body and Sectioned Boundary components. If you want to display the sectioned body, then set Visible "on" for the Sectioned Body and Sectioned Boundary components and assign them display properties as needed. Click OK three times.

You can also remove the live section view by deleting the section line that was used to create it. Select the section line that was used to create the live section view. Click Building Section Line tab, Live Section panel, Disable Live Section. After turning off the live section view, you see the regular 3D building model again. You can turn live section view on and off as long as the section line remains in the drawing.

Melinda Heavrin is a CAD Coordinator & Facility Planner for Norton Healthcare in Louisville, Kentucky. She has been using AutoCAD Architecture since release 2000. Melinda can be reached for comments and questions at melinda.heavrin@norton-healthcare.org.

Taking Ownership: I Got This!

We all "own" a lot of things—a car, a house, a pet (or are we just roommates?)—and we keep gathering more and more. We boast about the things we own. We protect, admire, and cherish the things we own. We also feel emotions related to what is "ours." So when we step into other people's areas of ownership, they often get defensive, protective, or admonish us to stay away.

The word "mine" emerges early in our toddler days. "Mine!" is heard so often in these early years. And while the spoken expression is heard less often as we enter adulthood, one may still see the "attitude" behind the word. It is often perceived as a negative attitude, resulting in behavior such as hoarding, excluding others, or being selfish.

But ownership is not bad. Ownership is a good attitude for a Tech Manager to have with regard to their duties and areas of oversight. Ownership is a mind set on action—not waiting for someone else to step up. We need to own things, own up to things, own the quality of our work, and own the outcome. We need to have healthy pride of ownership in the areas for which we are responsible. We need to extend these areas with a "come alongside" embrace of others in an expanding technology world.

So when is it healthy to say "mine"? When is it good to take ownership? Let's ponder that.

THE POSITIVES OF TAKING OWNERSHIP

Taking ownership shows others that you are willing to become proactive in your efforts. It tells them that you can handle the work and that they should trust you. It tells them that you are prepared to act and to take accountability for your actions. You own the results of any action or inaction for that area—this includes unexpected results of things that might be out of your control. You own this too. You will take initiative to maintain and improve this area. You are also taking responsibility and accountability for the execution and follow-through on items in this area.

With ownership comes responsibility. With responsibility comes accountability. With accountability comes reward for positive progress (and negatives when things fail). Rewards may include expanded influence, additional responsibilities, duties, and tasks. It may mean that you have impact in more areas. It may also mean that you will be rewarded with raises and promotions. Most companies reward those who are proactive in spotting issues, finding the root cause of problems, and moving toward solutions.

THE NEGATIVES OF TAKING OWNERSHIP

You can and will be blamed for things going wrong. You may see negative attitudes for systems failures. Everyone will tell you how to do your job better. (Actually, this happens even if you do not take ownership of areas.) Tech Managers often have a target on their backs. It comes with the job description. So why not take an ownership attitude and grab the reigns? At least then you are the master of your own fate. And as Tech Managers you already have the talent, training, and skills to do the job. If you do not take ownership, you will derail the rewards that you deserve as others may take credit, and you still are open to blame.

When you avoid taking ownership of an area, task, or process, others will notice. They will see that you fail to step forward or that you actually take a step back from the responsibility of that scope. When this happens, you will be seen as avoiding accountability, deflecting blame, or just being lazy. Consistently avoiding ownership will eventually create an environment where others no longer offer you the opportunity to expand your role. Never say, "That's not my job." It might open a door for others to take on your tasks and soon may get you replaced. Not good.

In my opinion, of all of the perspectives a Tech Manager should have, the one below is near the top of the list.

EVERY PROJECT IS MINE

Tech Managers should act like every project is their responsibility. Each file belongs to them. Every model is their model. Every office is their office. Improving everyone's productivity is their goal.

Taking an ownership attitude for everything that CAD/BIM touches is what a Tech Manager should be all about. Every piece of hardware, every procedure and process is theirs. Every standard, every layer, every linetype. It all belongs to the Tech Manager.

MOVING TOWARD OWNERSHIP

In the book *The Oz Principle: Getting Results Through Individual and Organizational Accountability*, authors Roger Connors, Tom Smith, and Craig Hickman share that "taking personal accountability means making a personal choice to rise above one's circumstances and demonstrate the ownership necessary for achieving desired results; to see it, own it, solve it and do it."

When Tech Managers move toward another level of ownership they should do it before others "assign them" this task. By taking on more than they are expected to oversee, they show initiative. Seeking responsibility increases their value. Those who are responsible for more areas prove to be more valuable to the firm.

Tech Managers who avoid taking on additional responsibility end up shedding it. They move farther and farther from the core of the business and out to the fringes. By doing this they are making themselves targets for possibly "transitioning away from the company." This means being sacked, canned, terminated, or fired, whatever term you want to use. A CAD/BIM Manager wants

"See it, own it, solve it and do it."

— Roger Connors, Tom Smith, and Craig Hickman
The Oz Principle

to be moving toward ownership, not away from it. If you deflect responsibility, it ends up resting on someone else's shoulders.

DON'T TRY TO OWN EVERYTHING

You may have an attitude of ownership for many things, but go gently when it encroaches on other staffers' areas of oversight. Taking ownership is a feeling of responsibility and bottom-line decision making for something. It is not just taking control. Don't be a bully, a squatter, or a usurper. You do not actually own everything. There are others in the firm that "own" things, too. Ask to be invited in. Seek to help others. Assist where you are welcomed and stay away from areas that seem to be closed off. No one likes to have someone "take control" of their area.

Tech Management is all about seeking, accepting, and embracing responsibility. Expand your area of influence by gathering responsibility for more and taking ownership of all tech issues within your firm.

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

Inside Track

by: Brian Andresen

Welcome to *AUGIWorld* Inside Track! Check out the latest opportunities to advance your skills, processes, and workflows in your firm with the most current AEC-related software and hardware updates available.
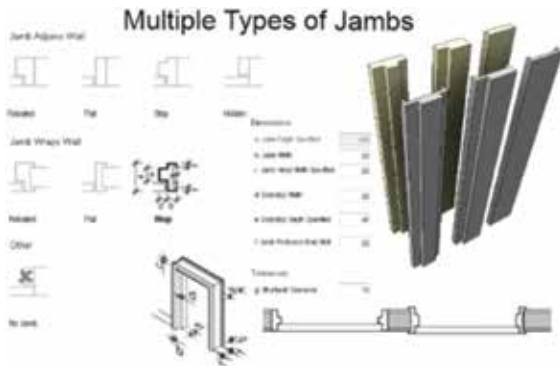
REVITWORKS DOOR FACTORY 2017 LITE

http://bit.ly/2lDUmqV

Create any hinge or double-hinge door you want in seconds, without going into the family editor.

- LITE creates standard and curtain panel single and double-hinge doors for free
- PRO creates standard and curtain panel single and double-hinge doors, bi-fold doors, surface, pocket, and contained sliding doors, garage doors, hatches, stacking doors, and even interconnecting doors

Summary of PRO Version Features

Save time by creating doors as and when you need them, allowing you to stay focused on your design.

- Add your own panels, handles, trim profiles, and other components, giving you unlimited combinations.
- Elevation Swing indicators points to hinge or to handle to suit international graphic standards.
- Doors have an appropriate level of detail allowing fast manipulation of doors and a manageable parameter list.
- Consistent shared parameters allow them to be scheduled together easily and logically, including standard and curtain panel doors.

CAD STANDARD

http://bit.ly/2n67HFQ

Cad Standard revolutionizes how you work with standard items such as layers, dimstyles, styles, linetype, blocks… from any external AutoCAD® file (DWG). With Cad Standard, easily access standard items on-demand, thus negating the need to have these items already in your drawing.

Individual users or large user groups can start benefiting from Cad Standard immediately after installing it with no setup required. Cad Standard allows access to standard items from centralized existing standards files, thus simplifying how you work and manage with standards.

PRINT2CAD 2017 – PDF IN DWG

http://bit.ly/2lYmXT2

PDF/JPEG/TIFF/HPGL/… to DWG Conversion to full editable drawing with the help of a standalone program. Features TIFF/JPEG vectorization and OCR text recognition.

The app includes:

- Top-quality PDF to DWG conversion with text and linetype Recognition.
- Automatic OCR recognition of texts (native, as raster or as line).
- Smart recognition of layers, circles, arcs, linetypes, etc.

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. Contact brian.andresen@augi.com

PRODUCT FOCUS

Manage Still Image Post-Production Elements

Still image post-production is often completed using the Render Elements options with 3ds Max®. The elements can be exported from 3ds Max during the render process as image files and can be used in conjunction with Photoshop to composite and quickly change them to produce alternate final products or add effects. These elements can be highlights from particular lights, shadows, reflections, textures, shapes of objects, colors, and more. By separating the elements, we can manipulate them with more control using tools inside software such as Photoshop.

For example, if a shadow in a rendering appears too dark, rather than waiting for a second render inside 3ds Max we could simply use the selection tools in Photoshop with that particular element and adjust the values for that element only. The same concept applies to lights that are too bright, reflections that need more clarity, or by changing a color of a particular object. Examples of a few of the various elements that can be created and used to manipulate a particular rendering are displayed in Figure 1.
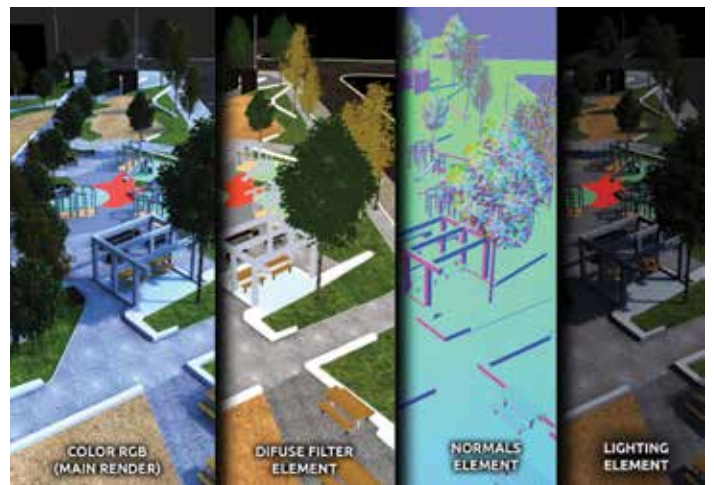
Figure 1: Examples of elements

Exporting the elements is a relatively simple task. To accomplish this, simply bring up the Render Setup Dialog box and select the Render Elements tab as displayed with Figure 2.
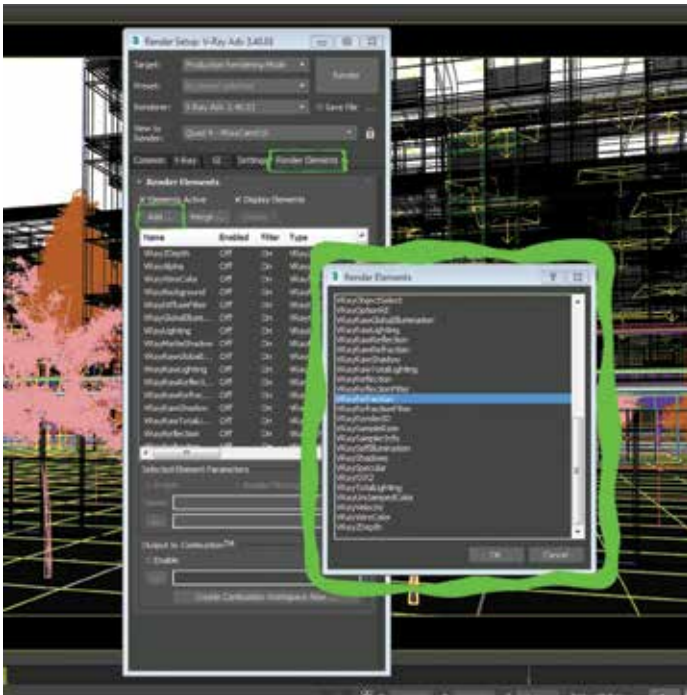
Figure 2: Elements tab

Next, select the particular element you want 3ds Max to separate into a file so that you can use it to manipulate your image when compositing in Photoshop. For smaller projects with fewer elements, this can be managed effectively with an efficient file structure and naming conventions. With more complicated scenes that require a higher level of customization, this particular step can be cumbersome to manage and even more difficult when working between two different programs.

A tool provided by Cebas Visual Technology (www.cebas.com) called PSD Manager simplifies the export process, giving us additional control to work between the two programs and manage the elements and changes effectively.

While the developers of PSD Manager offer a wide range of data, to review the software I thought it would be helpful to demonstrate its capabilities as I've found it an extraordinary tool to manage elements and work between 3ds Max and Photoshop efficiently.

Cebas offers a trial version of PSD Manager on its site with clear instructions for installation for 3ds Max versions 2013 through 2017. To demonstrate the power of PSD Manager, I'll start by walking through exporting a file using the PSD Manager plug-in. The first step is to select the Rendering menu and then Effects marked as shown on Figure 3.

This opens the Environment and Effects dialog. Here we select the Effects Tab, choose Add, and then select psd-manager as shown in Figure 4.

Here you'll find an extraordinary amount of options to control what is exported from 3ds Max into a particular PSD file. I'll walk through a few of them. First, I'll start with the Parameters Rollout shown in Figure 5.
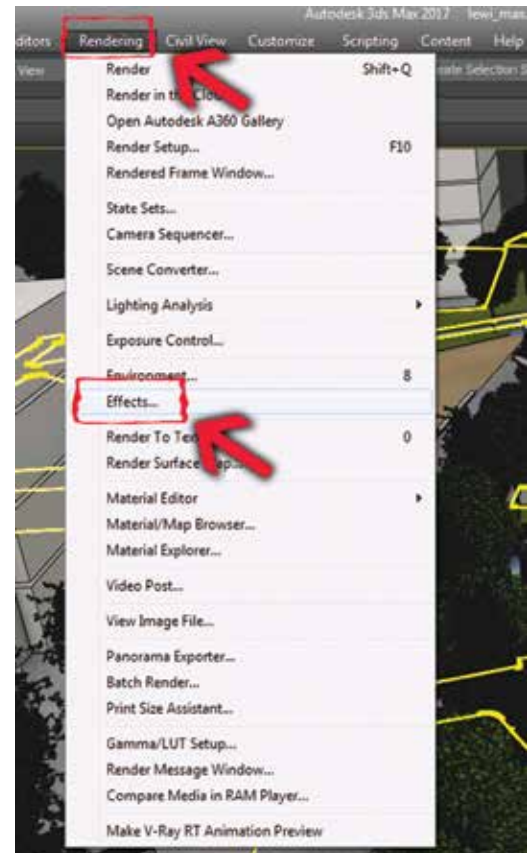
Figure 3: Effects
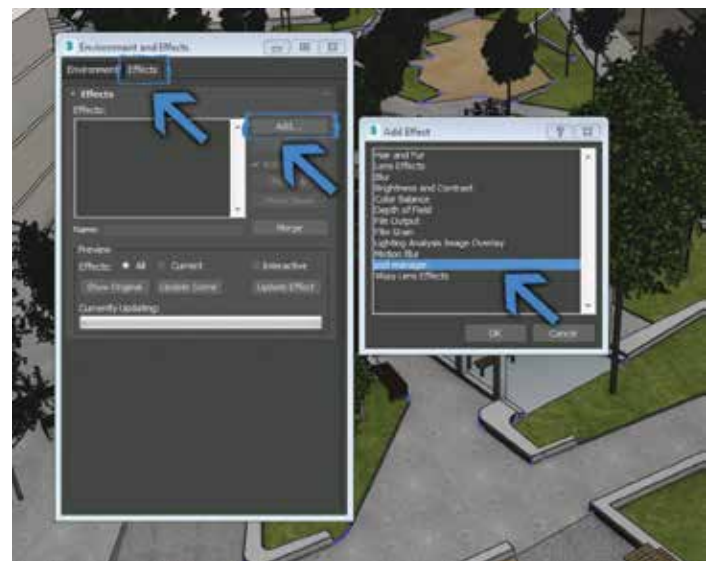
Figure 4: Selecting psd-manager

Here we choose the file name and exported format. This means we are not restricted to PSD files alone while helping us to adhere to applicable naming conventions or standards. One of my favorite options in this particular area is the File Format option, which allows us to control the resolution in dots-per-inch while giving us the ability to choose 8-bits, 16-bits, or 32-bits (HDR) per channel. Finally, we have the option to choose the image output method which could consist of Layers with Masks, Layers with Transparency, and more.

3ds Max 2017

Figure 5: Parameters Rollout
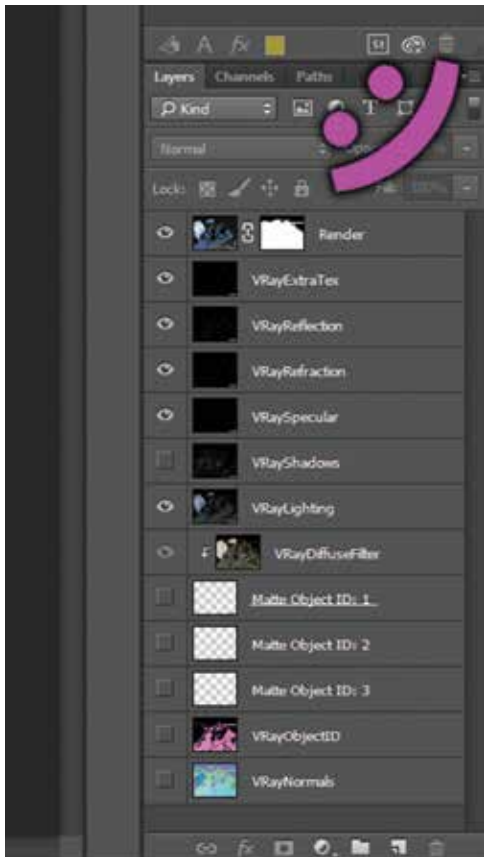
Figure 6: Layer list from PSD Manager exported PSD file

At this point we can select Render, where it will render our scene while creating the PSD file in the location we have specified. By right-clicking on the Files button it will open Photoshop (or alternative capable software) with the proper file open containing the various elements in our layer list as shown in Figure 6. If you have to composite element files often, this should make you as happy as it makes me.

PSD Manager doesn't stop there. We can choose to have mattes created for individual objects that can be used as limits for selections in Photoshop. For example, if we aren't entirely sure we like the color grey for a particular object, we can tell PSD Manager to export a matte for that object then go into Photoshop and use the options available to us there to alter the colors how we see fit. I attempt to demonstrate with Figure 7.
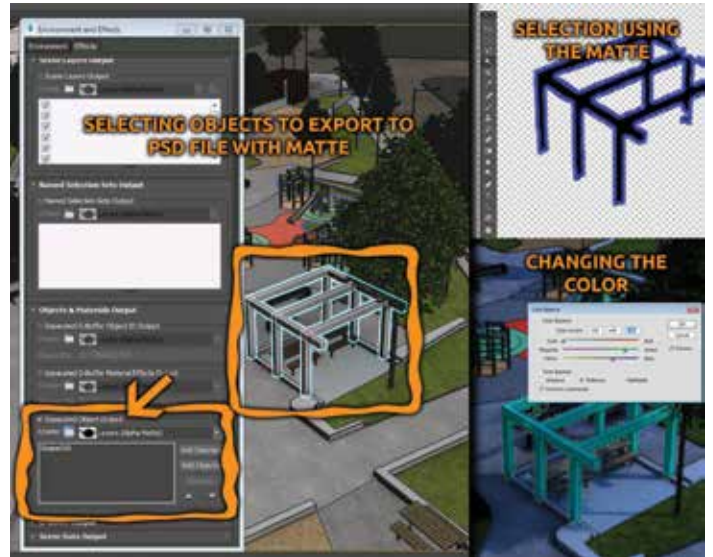
Figure 7: Mattes alter colors in Photoshop

In conclusion, if we use PSD Manager, we don't have to struggle with managing element files and compositing them in 3ds Max anymore. I recommend you visit Cebas Visual Technology's site to see examples of PSD Manager's capabilities related to the following topics:

- Deep-Data Masks (MatteShooter)
- Render Elements Outputs
- Vray Support
- Corona Support
- Name Selection Set Output
- Adjustment Layers
- PSB (Large Document Format)
- Scene Layers Output
- 32-bit PSD (High Dynamic Range)
- 3D Data for After-Effects
- Unlimited Network Rendering, and more

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

What's in a Name?

Keeping a team of Autodesk® Revit® users running in sync requires quite a bit of activity behind the scenes where BIM Managers may find themselves dealing with a cornucopia of often conflicting goals. There are licensing issues, training issues, standards issues, hardware issues, contract issues, templates, and not so oddly, jealousy issues.

Aside from all of that, BIM Managers must also craft a system of folder structures and file naming conventions that click into the culture of their firm allowing for consistency and productivity. Naming conventions may not stand out as the most important part of a BIM strategy, but when one considers the time taken every day by every user to find families, locate parameters, and navigate folders, the importance of a simple consistent convention becomes clear. Even those of us who have been doing the job for years can benefit from considering how we would do it if we were starting from scratch. I have tried to take that approach as I reflect on the examples and best practices presented in this article.

FOLDER STRUCTURES

Why does folder structure matter? Folder structure is the highway all company files ride on. It can also be a convoluted mess of one-ways and dead-ends. If users cannot quickly find projects, families, and templates, there is friction in the system that will fight against productivity every day. If there are folders that users complain about navigating to or naming conventions that require users to scroll through long lists of similar names, it's a sign that seconds are being added to that process every day. If files or folders get misplaced or people end up creating their own file structure, the structure is not working and should be reviewed.

Know that there may never be a more contemptuous battle than that of folder structure. We are creatures of habit and old habits die hard. The best most can hope for is making the entire company equally angry. My best advice is to fix the problem areas and leave as much as possible exactly the same. Keep in mind your top priority should be to facilitate finding files and data. I use a combination of file naming and folder structure for maximum impact. In concert, file structure and naming conventions can either complement or

Revit 2017 – MEP

confuse each other. Where you may have a ton of files in a single folder, having a good naming convention is better than more subfolders. I stop at three folders deep. After three clicks down, most people are done sifting; it is too much clicking and not enough finding.

FILE NAMING CONVENTIONS

With so many parts of Revit requiring a naming convention like families, parameters, and line styles, it makes sense to apply a single convention to all so users experience a consistent approach and BIM Managers do not have to teach more than one convention. I fall back on the CSI Layer naming convention from my AutoCAD® days. This common format, Major, Minor, and Descriptor, builds predictability that reduces training time and speeds searches. There are many approaches, but the most important aspect is predictability. Having

Figure 1

that predictability not only speeds searches for users, it can also click into the folder structure plan to reduce depth of folders and therefore clicks from users. To say it another way, having a naming convention that automatically sorts files by M, E, and P, means users won't necessarily need to create a Mechanical, Electrical, and Plumbing folder where the sorted files are.

Order for order's sake is fine, but remember to weight your changes against dollars. Consider if a click takes one second. You institute a plan reducing folder structure depth from six folders max depth to three. To be fair, not all folders were six folders deep, so say the average time saved per folder search is 1.5 seconds. Multiply that by the number of times a user may perform that search on an average day (in this example that number is 20). So a single person might save 30 seconds a day. My firm has 80 users performing these functions. Eighty users x 30 seconds equal 2,400 seconds, or 40 minutes. Using 2,080 hours in a normal work year, that equates to 83,200 minutes a year, or 1,387 hours a year. Multiply that by your billable rate, say $75 an hour, and you just saved the firm $104,025. Saving clicks makes money and wasting them will cost you. Do this exercise using your own numbers and the benefit of making changes should become very clear.

FAMILY NAMES

Names and structure should work together. When it comes to families, I like to use the file structure to separate M from the E and the Power from the Lighting. After that I use the naming convention to quickly find the light fixture family needed. A Lighting Fixture family might be named 277v 2x4 Surface. In
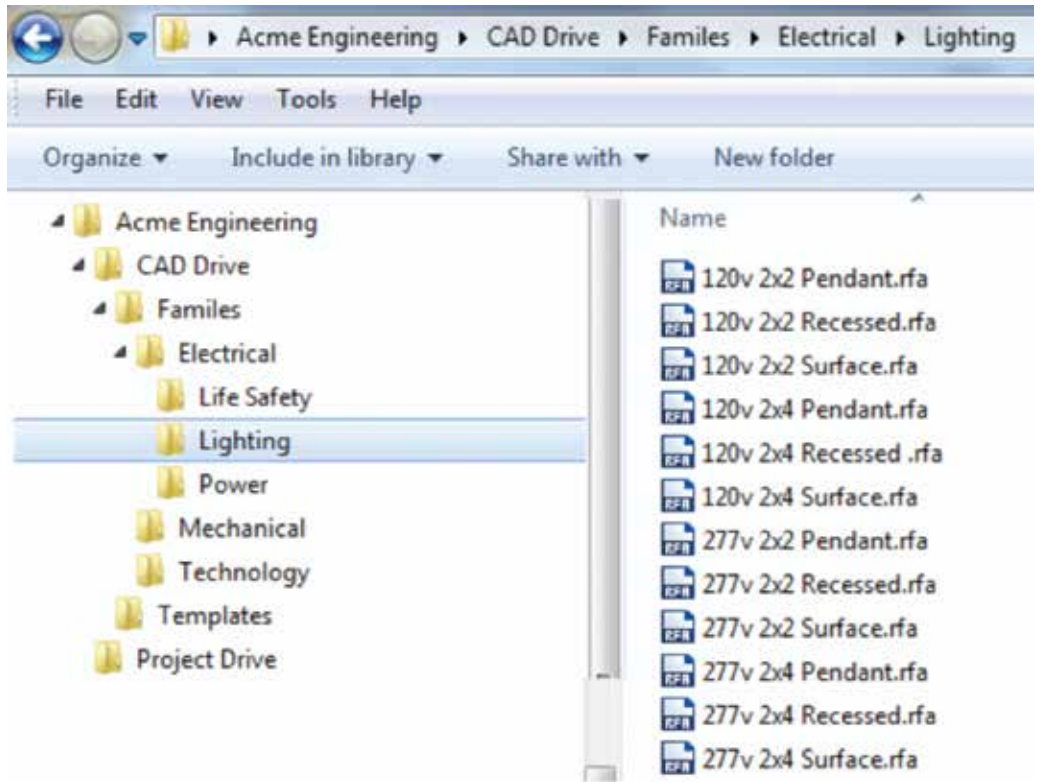
the correct folder, all the "like" voltages are together, so users can scroll there first. Then they can get to the 2x4 fixtures and quickly identify the surface mount fixture over the pendant mount or recessed. This method can easily be applied to power, HVAC, piping, and other disciplines.

PARAMETER NAMES

Naming parameters is tricky business. One, firms already have parameters whether we picked them or not. Two, everyone has to deal with the out-of-the-box parameters Autodesk provides, some of which you cannot remove. Three, the overriding reason for a BIM process requires a global standard for parameter naming—and there are one million to choose from. You probably have clients that are demanding multiple standards right now. That being said, maximizing a firm's capability and productivity are critically tied to a well-managed parameter-naming convention.

I have not been to a firm that has not evolved their parameter naming convention. These evolutions result from the fact that we have all gotten better at pushing Revit's functionality and have all thought of better ways to manage our data. Parameters, like hairdos, are personal, often driven by trends, and always seem to work better for the other guy.

To get to the best solution, go back to what parameters are really for. The basic function of parameters is to provide a placeholder identifier for the data in a model. That data should flow from elements to schedules. If data needs to be input by users into families, it helps for the parameter names to be recognizable by the newest users and organized for ease of entry.

A common first thought is to distinguish company parameters from all others by providing a prefix to all company parameters. ACME Engineering may begin all parameters names with AE. It is tempting to add an M, E, or P to sort parameters by the discipline with which they are associated, but it does not take long to find parameters that span disciplines. I prefer to keep parameters short and simple, such as AE.Voltage. Quantifying which parameters to make is easy. Visit the standard schedules and collect the headings. Consolidate these headings, recognizing that the same parameters may have differing header names in differing schedules. Electrically this is easier than mechanically. My firm has 11 standard electrical schedules and over 100 mechanical. A spreadsheet was required.

LINE STYLE NAMES

Firms will complicate line style naming, but I assert there is no real need. Keep it simple—AE1, AE2, AE3… covers all the bases, especially if the numbers refer to Revit line weights. Make it harder if you like by adding AE.Dashed, AE.Center, AE.Match, etc. I shy away from multiple weights for specialty lines.

PROJECT FILE NAMES

Project names are hard to alter. If a firm has been in business for one year, changing project naming is nearly impossible. Think about it this way. Fahrenheit made sense for temperature and we are all accustomed to it. Celsius makes way more sense, but change is hard. Take a slow but steady approach to altering project naming if the perceived benefit is worth the effort of a cultural change.

What are important elements to include in project names? It depends on business culture and clients. I have had clients ask that MEP be added to our file names so the other consultants can figure out which model has the MEP. It made a ton of sense so we made it standard. We also found that adding a Revit version number to the file name saved us some trouble early on before all the neat add-ins that allow you to back out of an accidental upgrade. We still continue to end file names with _v17 or something similar to indicate the Revit version. The team has found it too valuable to not know what version a project is without opening it. There is usually a project number involved in the project name. The project number ties accounting to production and helps the whole firm speak the same language. Some firms include a couple of digits in that number for the year the projects started. This is a massive help for sorting through projects in a single folder. Some firms like to categorize by the client served or client type. The end game is to decide how to slice the data in a way that is useful to those who must navigate the data.

VIEW TEMPLATES

Once people start using view templates, they tend to create a lot, making a solid naming convention very important. My advice for MEP users is to start with a discipline and end with the use—i.e., E-Lighting or M-HVAC. View templates get sorted alphabetically so this makes it easy for your folks to get to what they need. You may also need a view template to make architectural backgrounds consistent—i.e., A-Background or A-Arch. As I indicated above, it is tempting to create many view templates for every issue.

> The easier things are for users to figure out and remember, the more effective the firm will be and the faster it will happen, making the change worth the effort.

My advice is to limit your project template to less than 10 view templates and leave the specialty view templates elsewhere to be loaded on demand.

You may be weighting the effort of tweaking your Revit naming conventions by the benefit these changes may provide and saying "not going there." You might be right, but consider the calculation at the beginning of this article where saving 1.5 seconds for an operation equated to over $100,000 in a year's time. Every hesitation or misdirection your users have affects your firm's bottom line.

To make the best changes you must take your own time and the time of others up front. Calculate that upfront investment into your thinking. There will also be a transition period where users have to adjust to changes and reverse muscle memory. Productivity will take a hit for a period of time. This is why I stress keeping things as simple and as consistent as possible. The easier things are for users to figure out and remember, the more effective the firm will be and the faster it will happen, making the change worth the effort.

Todd Shackelford provides strategic BIM leadership for Alvine Engineering and is an Industry Fellow at the University of Nebraska. A regional advocate for Revit and BIM, he was instrumental in forming the Omaha BIM Collaborative and the Central States Revit Workshops, where he served as co-director. He authors two blogs: CAD Shack and The Lazy Drafter. A Revit 2013 Certified Professional, Todd is driven by a desire to make BIM easy. Tweet Todd @ShackelfordTodd or email Todd at tmshackelford@gmail.com

PRODUCT FOCUS

What's New in AutoCAD 2018

THE TLDR

AutoCAD 2018's biggest update is the new 2018 DWG file format. It has been five years since the last file format change. Some of the new items aren't really new, because AutoCAD subscribers received them as 2017.1 update. I've listed those separately in this article. There aren't many new features in 2018, but this release does add several good enhancements. While many of them are "small," these enhancements will make a difference in day-to-day use.

For most of them I'd say something like, "It's about time AutoCAD does that." Off-screen selection allows you to start a selection window, pan, and select the items off-screen. I hate it when I try to select a line and click on the gap in a dashed line. The hate has been removed! AutoCAD 2017.1 gave us Linetype Gap Selection. AutoCAD knows there is a line there even if it's a break in the dash. The System Variable Monitor now has one button that will reset all the variables the way you want. If more than one variable changes, click the magic button to right all the wrongs.

Another enhancement pertains to Text2Mtext, which will now convert your text with the option to leave each one its own Mtext object. Thank you!

Creating an xref is now defaulting to Relative Path. Don't like change? There's a new setting to put it back to Full Path. Oh, and you can set up a relative path xref before you save the file. There are other cool reference enhancements that I really like. Keep reading.

AUTOCAD 2017.1 RELEASE ITEMS

Now that AutoCAD is subscription only, Autodesk started rolling out mid-season updates. The AutoCAD 2017.1 release contained several new tools and changes, which have all been carried over into the 2018 release. If you did not update to 2017.1 you will get these items in 2018.

User Interface

"Off-screen selection" is now possible. A selection window can be started in a part of your drawing, then, during the selection, you can pan and/or zoom to another area of your file while still selecting, and anything in the window, even if it remained off screen, will be selected. This feature can be turned on/off using the new SELECTIONOFFSCREEN system variable.

Linetype gaps can now be selected within a command. Clicking on the open area of a dash line (not the dash) means you picked the line. This behavior has been expanded to complex lines as well as DGN linetypes and it works with all objects (polylines with width, splines, etc.)

Documentation

The Text to Mtext tool from Express Tools (TXT2MTXT) has been updated with new functionality and features. You can now select Mtext objects with Text objects to combine into one Mtext object. Character codes translate correctly between text and Mtext, Selected Objects now follows standard error checking (it won't select objects on a lock layer), justification of the new Mtext object is inferred based on the positioning of the text objects selected.

When no justification can be inferred, it defaults to top left. Numbered and lettered list formats are inferred when a single or double character is at the beginning of a line of text and is followed by a period. There is now an option to convert multiple text objects into Mtext without combining them into one Mtext object (I am so happy about this). Text objects that are selected are sorted using a top-down method that is relative to the current UCS with sorting being left to right for collinear objects. Multiple objects that are collinear are separated by a space. Existing line spacing can be retained or a set spacing can be forced with a new settings option.
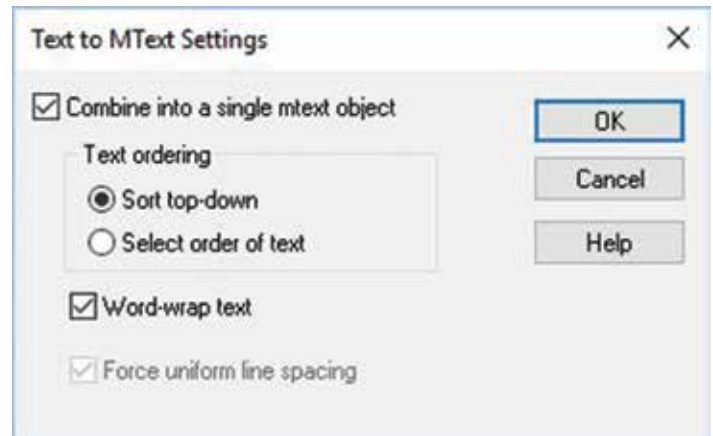
Figure 1: Access the Txt2Mtxt setting by typing SE after the command is started

TECHNOLOGY UPDATES

AutoCAD 2017.1 gave us a new command called REGEN3. This command regenerates views in a drawing that displays 3D solids and surfaces.

3D navigation works better when zooming, panning, and performing a 3D Orbit. Larger files should not degrade like they formerly did when you navigated the model.

AUTOCAD 2018 RELEASE ITEMS

User Interface Enhancements

The File Navigation dialog box that pops up when opening files (or saving, or attaching) will now remember the last sort order for a column that was used. If files were sorted by date, the next time a file dialog box is opened it will sort the files by date until the sorting method is changed.

AutoCAD 2018

Figure 2: The Layer control box is now available in the Quick Access Toolbar providing access to layers no matter what ribbon tab is active

The Drafting Settings dialog box can be resized. The True Color tab in the color selector dialog box supports comma separated entry of RGB values. When switching from the Index Color tab to the True Color tab, the color changes to RGB values. Switching to the Index Color tab will retain the RGB values.

The Layer Control button is now part of the Quick Access toolbar menu, but is turned off by default.

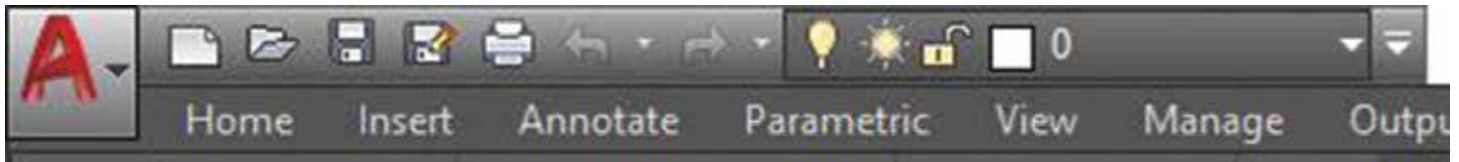The System Variable Monitor Status Bar icon will automatically display itself when a system variable changes from the preferred setting. The icon also has a new right-click menu that provides a button to reset system variables to the preferred settings with one click as well as options to configure the System Variable Monitor and to control the balloon notification.

The color of the AutoCAD rubberband line can now be changed in the Display tab of the Options dialog box.

Documentation

AutoCAD 2018 has improved on the PDF enhancements started in 2017. Adobe PDF files don't recognize AutoCAD SHX fonts. When AutoCAD makes a PDF, it converts those fonts to geometry. If that PDF is then put back into AutoCAD as linework, the text was imported as lines. Now 2018 recognizes SHX fonts from a PDF and gives you the option to convert those lines to a font. A Settings option is there to help manage which SHX fonts you want to use/not use. Fonts can be added or removed from the list of SHX fonts as desired.

Additional PDF enhancements include a new thumbnail preview of selected PDF files in the Select File dialog box when using the PDF Import and Attach tools, fixed orientation issues with TrueType fonts, scaling of the imported PDF in model spaces, which means the PDF is called to real-world size if all viewports are the same scale, and there is now better form data support when importing PDF files.

Collaboration

AutoCAD 2018 has had several enhancements to the functionality of external references (xrefs). A new system variable controls the default path type (REFPATHTYPE). Set to 0 for no path, set to 1 for Relative path, and set to 2 for Full path. AutoCAD 2018 allows you to set a relative path to an xref when you are working

in an unsaved (or unnamed) file. In past releases this could not be done. Once the file is saved, the saved path dialog box field will update accordingly. Until then an asterisk will appear in the box letting you know the file must be saved. If you save the file in a different location, a prompt will appear asking you to update the relative path of the xref file.

There are two new options when right-clicking on an unfound referenced file in the External References Manager dialog box. They are Select New Path and Find and Replace. Select New Path lets you browse to the proper file location then gives you the opportunity to apply that new location to other missing xrefs in the current file. Very handy. The Find and Replace option locates all references that use the same path (from all the selected files) and replaces all paths with a new one that you provide. This, too, is very handy. Also, when you choose the Change Path Type in the External References manager when right-clicking an xref, it will gray out the current path type, making it easier to select the desired type.

Nested references will now be displayed as "Orphaned" instead of "Unreferenced" if the parent file is Unloaded or Not Found. They also appear in a proper tree menu under their parent file.

The Open option is no longer grayed out when trying to open an unloaded xref.
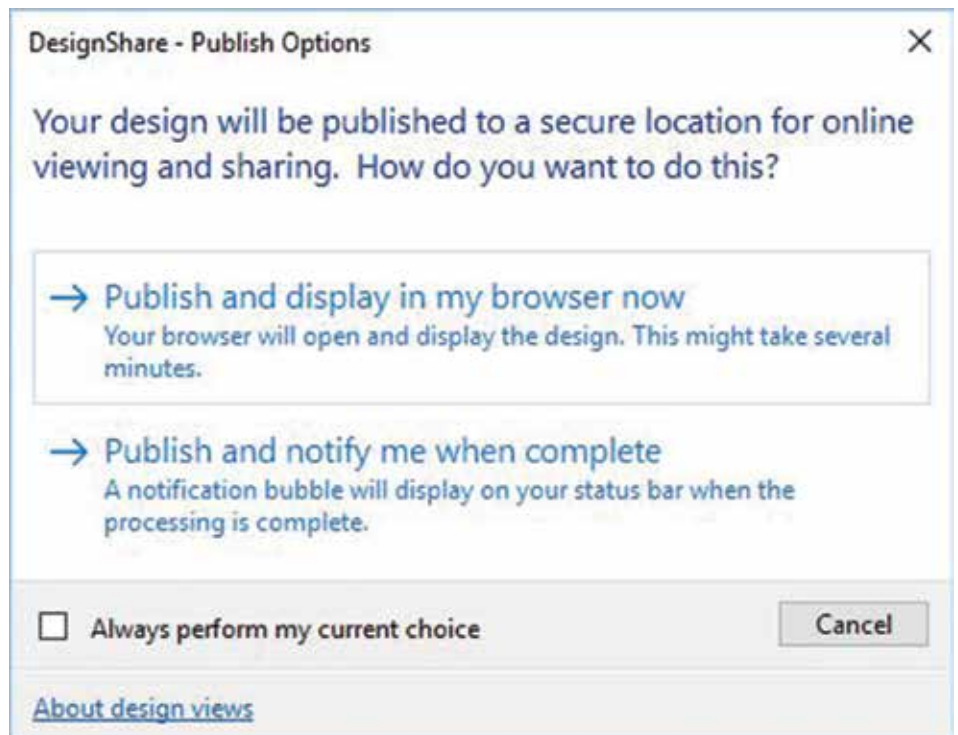

Figure 3: Click the Share Design View in the A30 ribbon tab to publish a browser-based, read-only view of your drawing

Figure 4: AutoCAD 2018 has a new DWG format. You can still "back save" to older versions to share with others

Renaming an unloaded reference file in the External References Manager palette no longer automatically reloads the file.

If you rename an xref file from a tool other than the External Reference palette (classic Xref Manager, or use the Rename command) the External Reference dialog box automatically renames the file. No need to reload it.

Sharing files safely is now a bit easier with Share Design View. Share Design View puts your drawings in the cloud with your A360 account and provides a link that you can share with whom you want to see the file. They can't access the file, only view it, and these "stakeholders" won't need to log into A360 or have an AutoCAD-based product installed. The files you upload are only available for 30 days, but that can be extended at any times for an additional 30 days. You can also post, review, and resolve comments.

An AutoCAD subscription also gives you access to the AutoCAD mobile app.

TECHNOLOGY UPDATES

In this section we'll take a look at the "under the hood" updates. They are usually boring and many people don't bother with these as they typically promise speed enhancements, better performance, higher quality, and the like. Still, here they are.

- AutoCAD 2018 claims to improve save performance. I'm not sure what that means to be honest, but I'm told it pertains to saving files with blocks that have annotation scaling, Mtext with columns, and attribute and attribute definitions with multilines. The auto-save function will now make incremental saves instead of full saves. So when AutoCAD pauses during your command to do an autosave, it won't last as long.
- AutoCAD 2018 has support for 4K monitors!
- The Graphics Performance tool now lets you turn on/off Smooth Line Display while still using the other settings. The Hardware Acceleration tools also work better now with low-end devices.
- The Online Map tool has been updated to use Bing Maps v8.0.
- In January 2017, Autodesk Seek operations were transferred and will now be BIMobject AB. BIMobject is an online resource of product information that can be accessed directly from Autodesk products.
- iDrop has been removed because it was using outdated technology and had a potential security risk.
- The BIM 360 ribbon tab his now gone from the AutoCAD 2018 ribbon. The plug-in can be downloaded from the Glue page if you want to use it.

Perhaps the biggest change in AutoCAD 2018 is the new DWG file format. Autodesk promises it will bring faster saves, more effacement opening of files, better 3D object creation, and higher quality visualization due to using a new geometric modeler.

Brian Benton is a CAD Manager, CAD Service Provider, technical writer, and blogger. He has more than 20 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 has been Cadalyst magazine's Tip Patroller, is Infinite Skills' AutoCAD training video author and a Wiley Publishing author. Feel free to contact him at cad-a-blog.com.

Revit 2017 – Architecture

by: Jesper Wallaert and Sylvester Knudsen

Configuring Generative AECO Dynamics: A Case Study

ABOUT MT HØJGAARD

MT Højgaard is part of MTH GROUP, one of the leading companies in the construction and civil engineering industry in the Nordic region. The company strives to become the preferred business partner across the industry by proving and continuously improving its high levels of professional competence and know-how.

MT Højgaard and the Group undertake projects in Denmark and specific activities in selected countries. MTH GROUP's vision is to become the most productivity enhancing group in the construction and civil works industry. (Besides MT Højgaard , the Group consists of the companies Enemærke & Petersen, Lindpro, Scandi Byg and Ajos as well as the partly-owned companies Greenland Contractors and Seth.) Productivity, sustainability, intelligent solutions and quality are focus areas for the MTH GROUP's 4,200 employees. The Group generates annual revenue of about DKK 7 billion. For more information see http://mth.com/About_Us.aspx
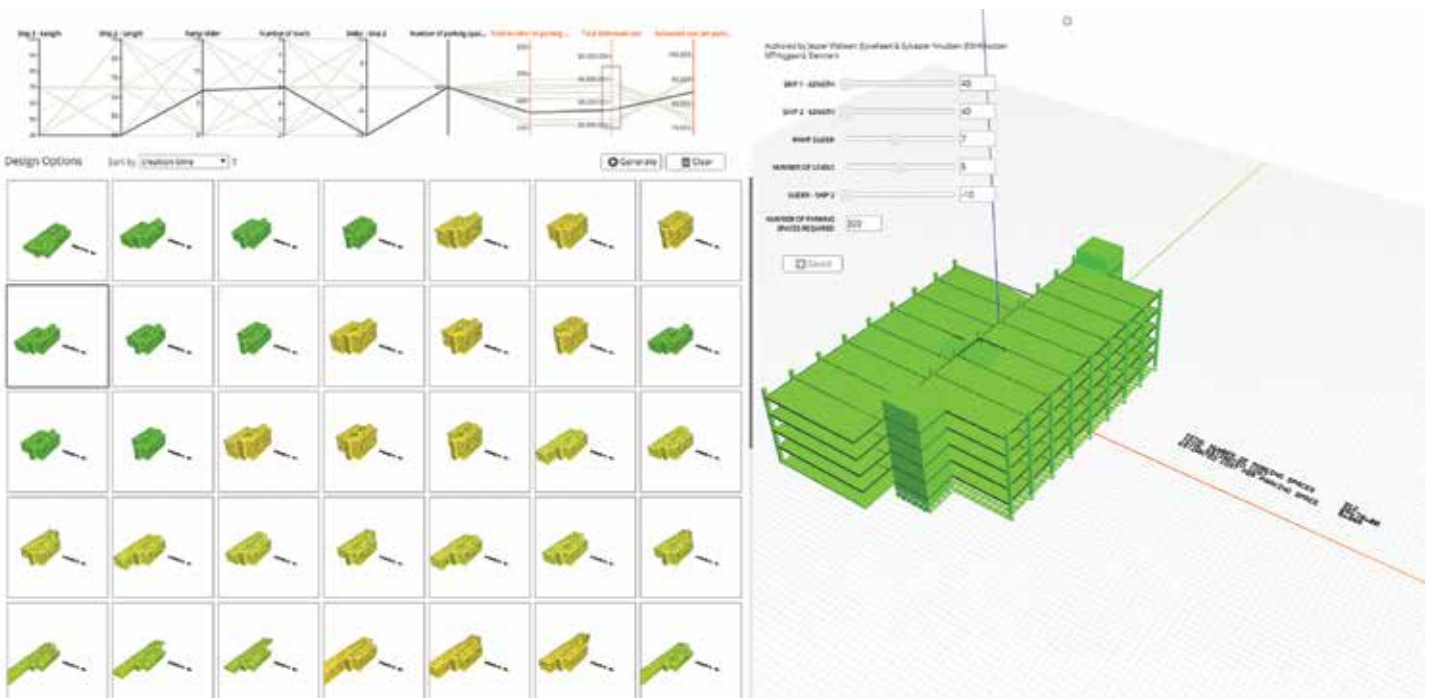
ABOUT VDC

The majority of the building and construction industry around the world that uses VDC, short for Virtual Design and Construction, uses it as a digital modeling tool made to design, optimize, and evaluate construction processes virtually. By using VDC, simulating an entire construction project from 2D to 6D before breaking ground is now possible. The added dimensions which are BIM (3D), time (4D), cost (5D), and facility management (6D), enable us to gain valuable insights into the entire project and to minimize risks and potential clashes that would otherwise only be discovered when causing an undesirable halt in the building process at the construction site.

At MT Højgaard, we approach VDC differently. We think of it as a method and an approach and not just a tool, and we have gained a high level of expertise based on in-depth research, tests, and experiments. To MT Højgaard, VDC is a way of thinking, a way of securing the highest possible quality of a project at an early stage of the process, and a way of improving the way the entire industry approaches a given project. By using VDC as a mindset, we strive to lead the industry in a more efficient and productivity-enhancing way.

At a practical level this means that we at MT Højgaard do our best to integrate and execute every part of a project virtually such as design, time, and cost before we start building in real life, thus incorporate our value chain at an early stage. We do this in close collaboration with both our clients and partners in order to optimize the project. When working with VDC as a mindset, engineers, architects, advisors, and clients can all work together as a team from the beginning and focus on the project as a whole. It helps us tear down barriers between our different disciplines which, during the process and at the end, benefits both the people and companies taking part in the project, and it assures a higher quality outcome. VDC could be a real game-changer that would not only lead to higher productivity and less clashes at the construction site, but also lead to less frustration along the way and more motivated and enthusiastic people.

THE PARKING GARAGE CONFIGURATOR

The Case: MT Højgaard's self-built construction of a parking garage for our new group headquarters in Søborg, Denmark. The virtual design and construction (VDC) department was asked to join the project and come up with cost alternatives by optimizing some of the parameters behind the rule-based design of the

concept. The standard parking garage concept is also developed to address the Danish market regardless of the site. We ended up having a data-driven design solution from early conceptual design all the way to construction documents and object-based estimation with four products connected though Dynamo.

Phase 1: Parametric Concept Model

We decided to use Dynamo for the creation of a rule-based parametric concept definition. We identified the parameters of the standard concept structure such as levels, lengths, number of parking spots, and other factors including total cost and average price per parking spot that all play an important role in the success of the project. We quickly created the foundation for a Dynamo approach. The first thought was a workflow directly on top of Revit. After a series of meetings and dialog about the master plan for the workflow, we agreed to split the tool into two phases. The first phase would focus on the preparation of a proof of concept definition providing the base for the early-stage Conceptual Design model. In phase two we would use the base definition from Dynamo Studio and, via Dynamo for Revit®, built a Revit generator as originally intended.

The geometry generated within Dynamo provides an excellent visual representation, but it's not a very user-friendly environment. To provide a better end user platform, we ended up using Dynamo Studio and the Customizer to bring the design into FormIt 360.
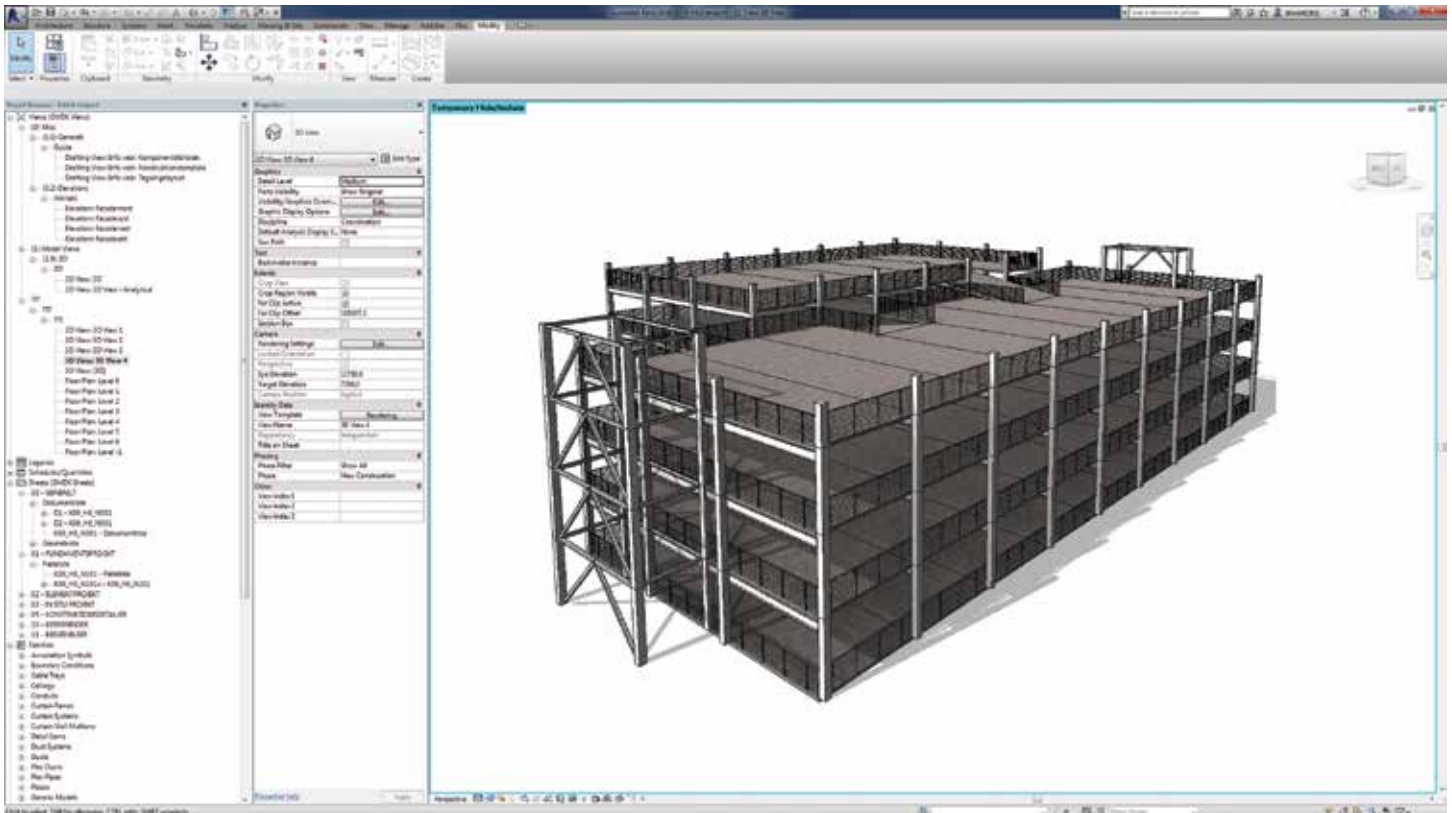
lots and price estimation in real-time while adapting it to the client's wishes. After finding the best fit for the client, the output from the conceptual design model (phase one) was then used as input in the Revit generator definition, which created the detailed design model in Revit.

Phase 1.1: Generative Design

But it didn't end there. During the development, we were lucky enough (1 out of 50 people) to get access to Project Fractal's alpha program and, with only a little adjustment, prepared the definition to work inside Fractal. Project Fractal runs your Dynamo definition through the cloud to analyze a design space of possible inputs and helps the designer determine the configurations that best meet the criteria of fitness. Now we had a solution to automate the optimization process of finding cost alternatives. After adding a cost mechanism and color visualization on top of the original definition, we fed it through Project Fractal to see which combination arrived closest to the cost target. From the options generated, we then refined until we found 5-10 optimal cost alternatives and presented it to the client.

While this does not necessarily design the entire parking garage automatically, it is an excellent tool to create thousands of garage scenarios optimized on parameters of our choosing and validates a particular decision in the early stage of a design.

The combination of the two products made it possible for our sales team to meet our client inside FormIt. In order to evaluate the site we use FormIt and create the site context and try some further options with the dynamic model. We built an output dashboard in the definition to dynamically show outputs for number of parking

Phase 2: Parking Garage Generator

After locking the conceptual design of the parking garage structure, the next step was to turn the dead geometry created in Dynamo, FormIt, and Fractal into hardcore BIM objects. The process of converting the parameters identified in the concept
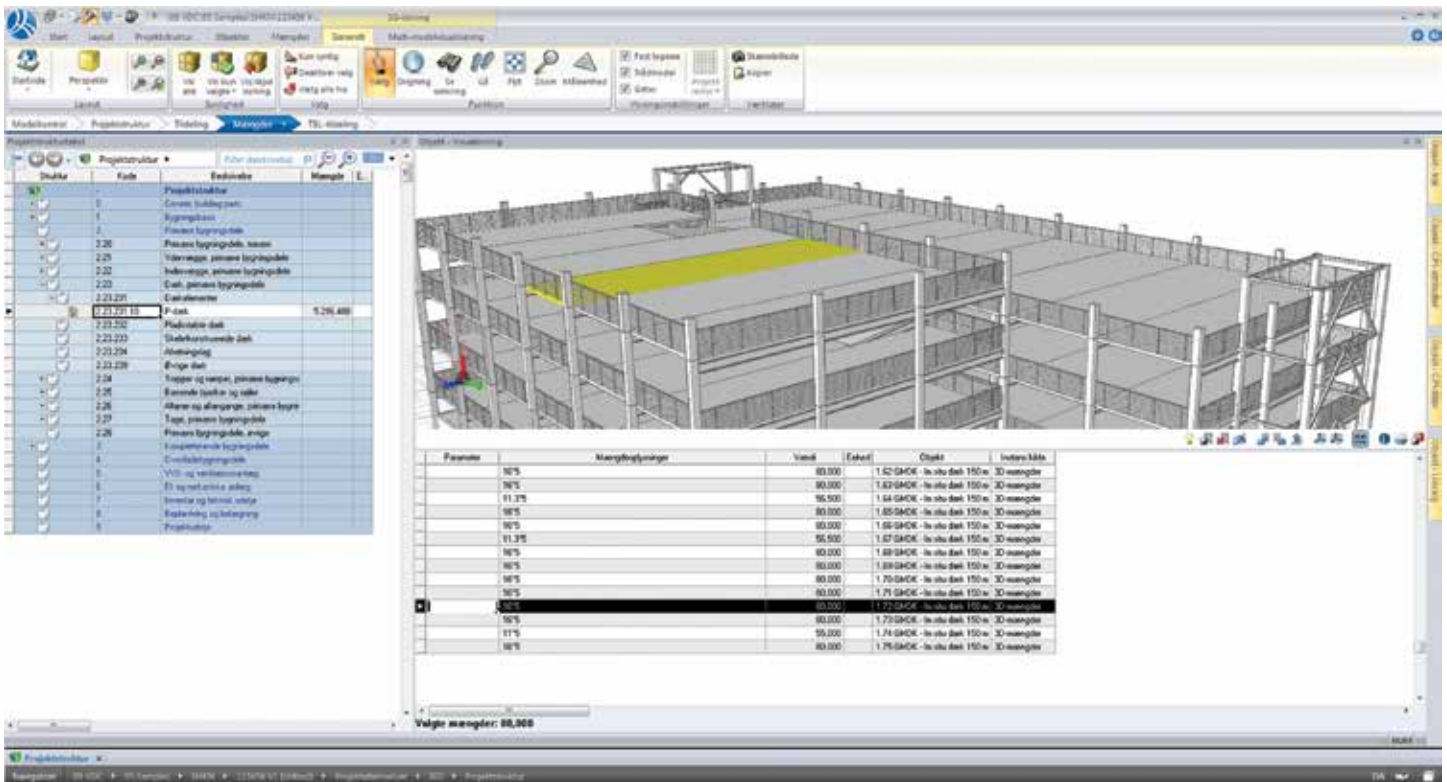
model into a Revit model is based on a Dynamo graph that has the same foundation as the script for generating the concept model. The big difference is that instead of making Dynamo geometry, it now creates fully parametric Revit families, which can be used for estimation, fabrication, and so on. Basically the script uses the data that was found in the concept model, and from these data generates the entire structural model of the parking garage. From the data collected from the concept model, the script has built-in rules that, based on these data, define things such as number of columns and beams, placement of structural reinforcement, creates the appropriate amount of levels, and much more. From these data we are able to automate almost all of the modeling process.

To make sure that object naming, parameters, and classification are always done in a standardized way, a special Revit template is created for model. This template contains all the parts used in the structure with two to three alternatives to each object. By making sure the naming conventions are always done in the same way, we create a link to our VDC software that enables us to do automated quantity takeoff and 4D simulations.

Phase 3: 4D/5D Model

In the last phase of the project, we went from 3D to 4D and 5D, through our VDC software iTWO. In iTWO we could perform quantity takeoff, estimation, and simulation of the building process. With the generated Revit model, we were able to almost fully automate the process of quantity takeoff, estimation, and simulation. By using standard naming and classification, an iTWO template was made so that every time a new model was loaded into iTWO, everything was set up and ready to give accurate price estimation and time scheduling. By automating these processes

we could present the customer with alternative solutions for the structure, which means the customer could see the consequence of every choice made, a lot faster.

As a contractor, we also get a lot of benefits through the simulations of the building process, as we can build the parking garage as many times as we want on the computer before we start the actual building process.

Jesper Wallaert is a VDC specialist at @MTHoejgaard and uses his experience providing computational design and construction research, development, and automation for digital design solutions at MT Højgaard. Jesper can be reached at jw@mth.dk

Sylvester Knudsen is a Building Informatics master student at Aalborg University, also working @MTHoejgaard as part of the Computational Design and Construction group, whose goal is to implement and develop computation in the company's daily workflows. Sylvester can be reached at shkn@mth.dk

PRODUCT FOCUS

Corridor Construction Simulation for BIM Managers

Most BIM Managers recognize that Building Information Modeling (BIM) is not a specific software program. It is a streamlined process that allows us to make better decisions about project designs based on reliable information analysis. Part of that analysis can include creating a construction simulation to see how everything will fit together during the construction phase of the project. This helps engineers better predict a project's performance to increase safety, constructability, and sustainability before it is built; thus facilitating better decision making and more economic project delivery. In this article, I share what the BIM Manager needs to do to set up the AutoCAD® Civil 3D corridor model for a construction simulation using Autodesk Navisworks® TimeLiner.
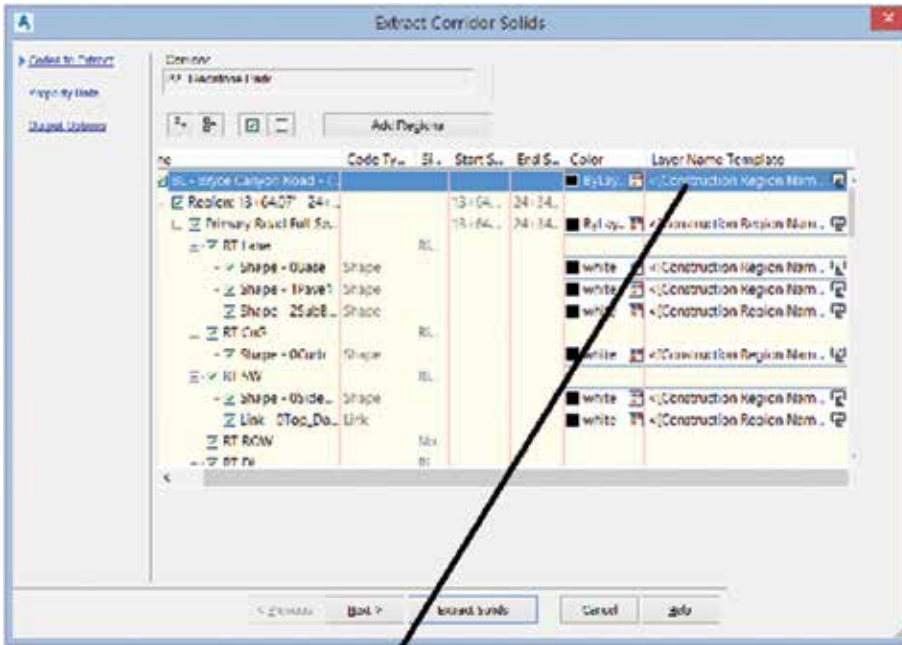
In AutoCAD Civil 3D, multiple parts make up one road corridor in the model, as shown in Figure 1. During construction, the entire road would not be built all at once. First, grading would be done to set the datum elevation for the site. Then the sub-base and base would be laid down. Next the sidewalks and curb & gutter would be poured. Finally, the asphalt or concrete would be poured for the wearing course of the road.

Figure 1: Corridor parts

PREPARING THE MODEL IN AUTOCAD CIVIL 3D

When creating a construction animation using Timeliner, you can create the simulation to match a real construction schedule. To do this, you must separate the corridor model into parts in AutoCAD Civil 3D before taking the model into Navisworks. By creating separate parts for each material (sub-base, base, sidewalk, etc.), you can show the road being constructed one layer at a time—just like it would be during construction. It also allows you to break it up into specific lengths to match how much the construction crew will work on each day.

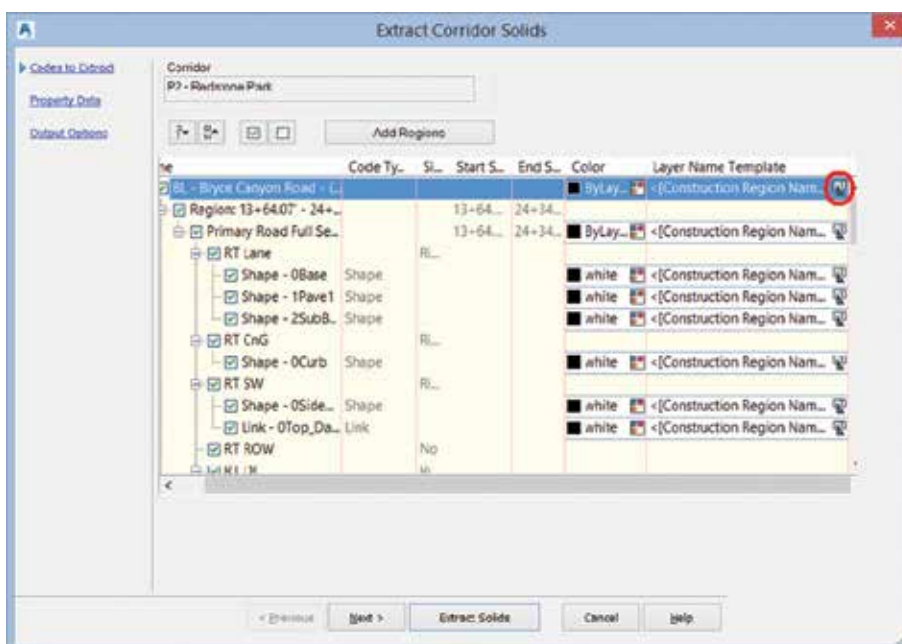*Figure 2: Corridor solid layer names to match PM task names*

Figure 3: Extract Corridor Solids dialog box

When converting a corridor to solids, it is important that the Layer Name Template match the task names in the project management database, as shown in Figure 2. This makes it much easier later to link objects in the model to the construction schedule.

How To: Extract Corridor Solids

1. In AutoCAD Civil 3D, select the corridor.

2. In the Corridor contextual tab>Corridor Tools panel, click (Extract Corridor Solids).

3. In the model, select the regions for only the area you wish to extract. Options include:

   • Station range: Has you first select a region, then you are prompted to specify the start station. You can use the mouse to select it or you can type a start station in the command line. After setting the start station, you are prompted to set the end station.

   • Within Polygon: Allows you to select a previously created polygon.

   • All regions: Selects the entire corridor model.

4. In the Create Solids From Corridor dialog box, make sure the Layer Name Template matches the item names in the project management task list.

   • In the Name Template column, click (Modify Name Template) next to the Baseline, as shown in Figure 3.

   • Selecting the Name template for the Baseline ensures that all the regions are updated to the new Name Template.

   • You must do this for each baseline listed in the Extract Corridor Solids dialog box.

5. In the Name Template dialog box, do the following, as shown in Figure 4:

   • Select Construction Region Name in the Property fields drop-down.

   • In the Name field, highlight everything, then click Insert.

   • Select Codes in the Property fields drop-down.

   • In the Name field, place your cursor at the end, click Insert.
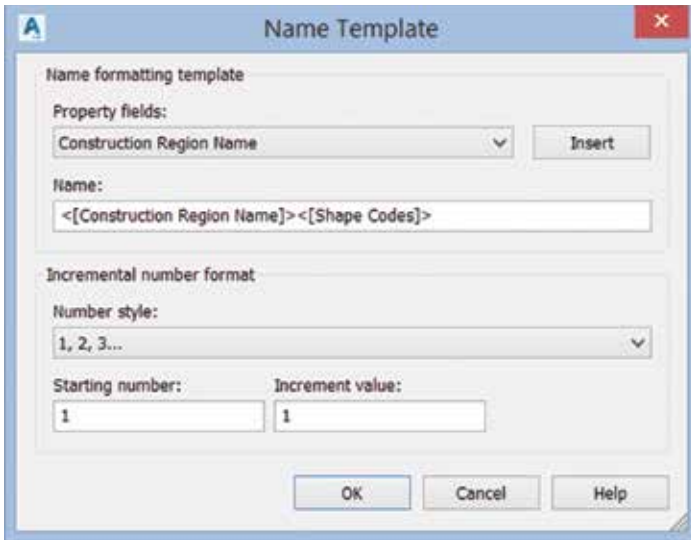
   • Click OK.

Figure 4: Name Template dialog box

Figure 5: Extract Corridor Solids output options

Figure 6: Corridor solid layers

6. In the Create Solids From Corridor dialog box, click Next twice.
7. In the Create Solids From Corridor dialog box>Output Options page (shown in Figure 5), make sure that AutoCAD 3D Solids (based on corridor sampling) is selected from the drop-down list. Then select where you would like the solids stored. Choices include:
   - Insert into current drawing (recommended if you already have a Navisworks model created that includes the Civil 3D road model)
   - Add to an existing drawing
   - Add to a new drawing
8. Click Extract Solids.

RESULTS

If you already have a Naviswork model created with the AutoCAD Civil 3D model appended, and you selected the option to Insert the corridor solids into the current drawing, as shown in Figure 5, then all you need to do is refresh the Navisworks model. The result of all this is that each of the corridor solids become its own layer. In Navisworks each solid is listed by layer in the Selection tree, as shown in Figure 6.

POPULATE THE PROJECT MANAGEMENT TASK LIST

All that is left for you to do is make sure that the project management software you are using lists tasks for each corridor solid. One very fast way to do this follows.

How To: Populate the Task List and Ensure a Perfect Match

1. Open the AutoCAD Civil 3D Layer Properties Manager.
2. Select all the layers that contain corridor region names. (Hold down <Ctrl> or <Shift> as necessary to select more than one.)
3. On the keyboard, press <Ctrl> + C to copy the layers to the clipboard.
4. Open Microsoft Excel or another spreadsheet program, put your cursor in one cell.
5. On the keyboard, press <Ctrl> + V to paste the layer information into the spreadsheet from the clipboard. You should end up with something like what is shown in Figure 7.
6. Clean up the columns, then port the layer names into your Project Management database as task names.
7. Add the start and end dates for each task—per when each corridor structure will be constructed on the project site.
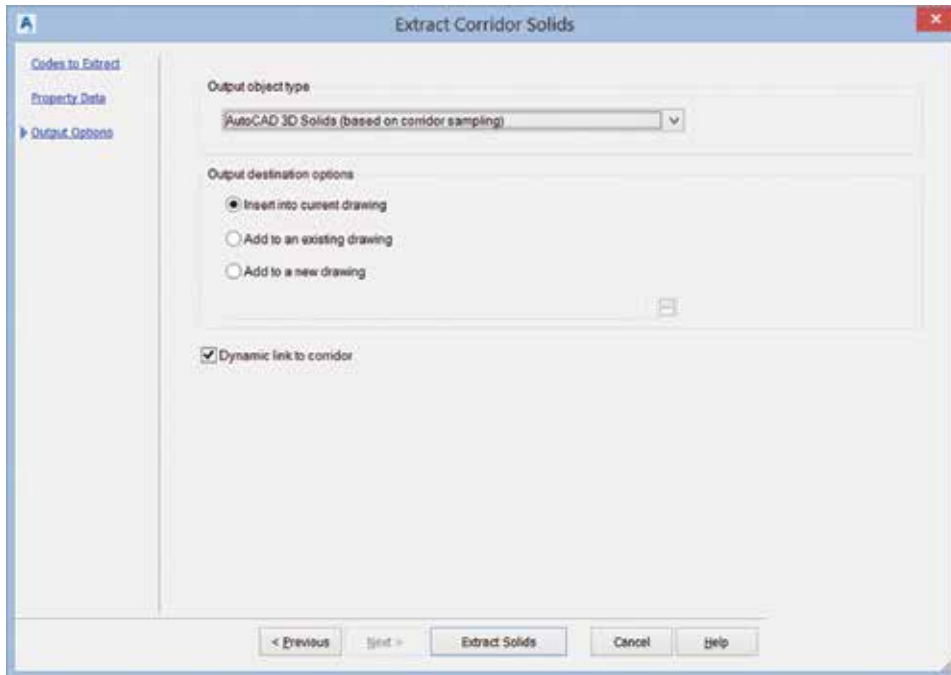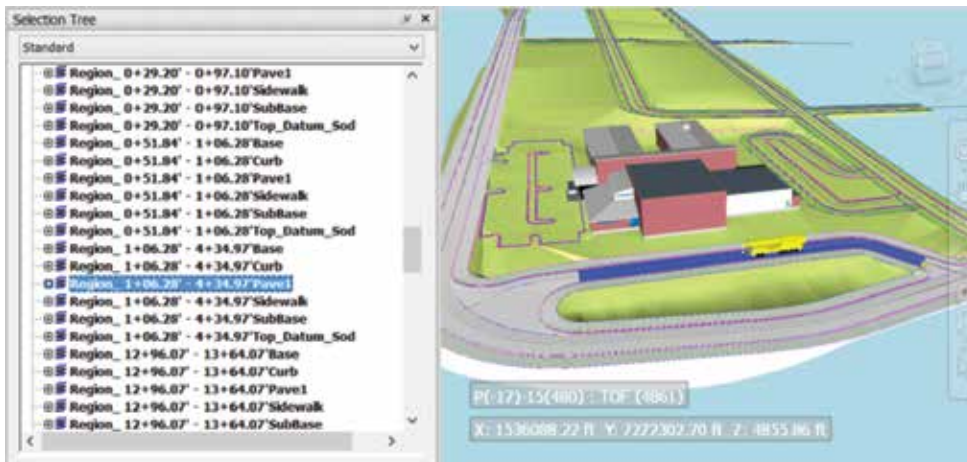
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	kUsed	Region_ 0+24.49' - 1+28.32'Base	TRUE	FALSE	FALSE	white	Continuous	ByLineWeightDefault	0	Color_7	TRUE	FALSE	Region_ 0+24.49' - 1+28.32'Base	
2	kUsed	Region_ 0+24.49' - 1+28.32'Curb	TRUE	FALSE	FALSE	white	Continuous	ByLineWeightDefault	0	Color_7	TRUE	FALSE	Region_ 0+24.49' - 1+28.32'Curb	
3	kUsed	Region_ 0+24.49' - 1+28.32'Pave1	TRUE	FALSE	FALSE	white	Continuous	ByLineWeightDefault	0	Color_7	TRUE	FALSE	Region_ 0+24.49' - 1+28.32'Pave1	
		Region_											Region_	

Figure 7: AutoCAD Civil 3D layers copied into a spreadsheet

TIPS IN NAVISWORKS

After you bring the project management task list into the Navisworks TimeLiner, you can automatically link the corridor solids to the tasks. This is done in two easy steps.

How To: Link the Task List to Corridor Solids Automatically

1. In the TimeLiner>Tasks tab, click [icon] (Auto-Attach Using Rules).
2. In the TimeLiner Rules dialog box, select only the last rule Map TimeLiner Tasks from Column Name to Layers with the same name, Matching case and click Apply Rules, as shown in Figure 8.
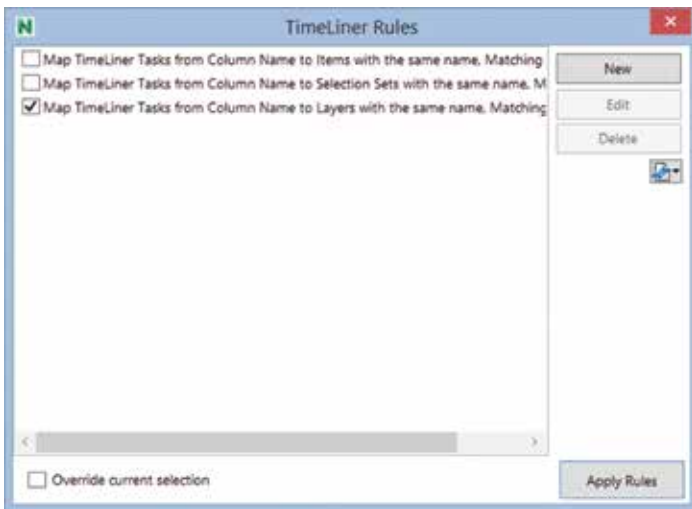

Figure 8: TimeLiner Rules dialog box

CONCLUSION

When it is all said and done, you are able to simulate the road corridor being built. If there are buildings going in at the same time as the road, you can also add that schedule to the simulation, as shown in Figure 9. Additionally, you can link TimeLiner and Animator inside Navisworks to see how all the different pieces of construction equipment move around the site to ensure each has ample room to complete its tasks.
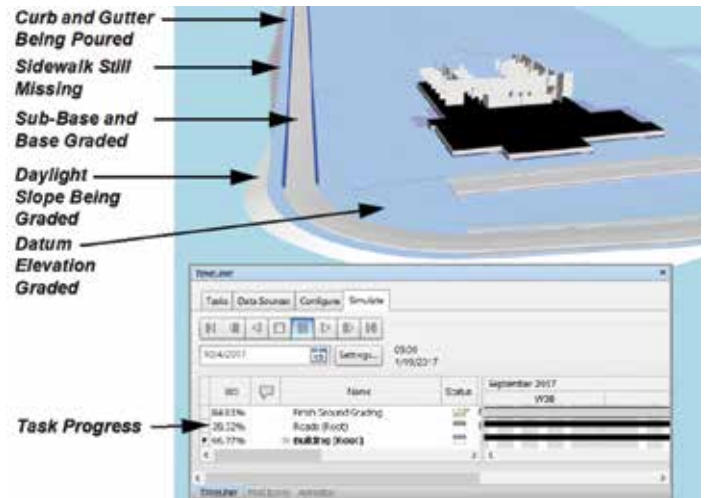

Figure 9: Simulation in progress

I hope this gives a good overview on how to set up a corridor construction simulation for all the BIM managers out there. Until next time, happy modeling.

Michelle Rasmussen started in the Air Force working in the Civil Engineering unit as a surveyor, designer, and construction manager in the early 1990's. She has worked for both municipalities and consulting engineering firms as an engineering/GIS technician where she completed transportation studies, environmental impact studies, and drafted subdivision and site plans. She has been training people on Autodesk products since 2000 and is currently an author for ASCENT (ascented. com) where she writes books for Autodesk infrastructure software products such as AutoCAD Civil 3D, Autodesk InfraWorks 360, AutoCAD Map 3D, Autodesk Navisworks, and general AutoCAD.