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# AUGIWorld

The Official Publication of the AUGI Design Community  
March 2020

# Tips and Tricks For 2020

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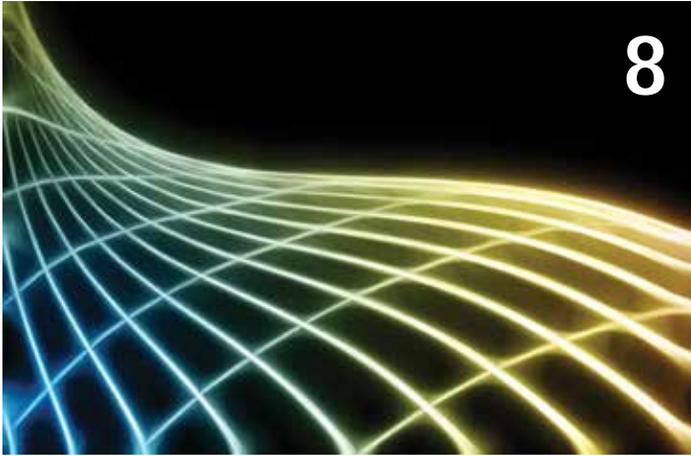


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# Letter from the President



## GREETINGS!

It is March Madness time! I am not a basketball fan, but March Madness tends to grip the attention of many of my acquaintances during this month. The excitement of the college games, the brackets, and the upsets, keep fans glued to the television for the month of March. Personally, I prefer watching spring unfold in the northeast U.S. March signals the light at the end of the tunnel for winter, and the start of warmer weather.

This month, several of the AUGI board members and authors will be presenting class sessions at ATG's Midwest University. This conference is being held March 18-19, 2020, at the Mystic Lake Casino outside Minneapolis, Minnesota. If you have not been to MU, I highly recommend it! MU is a scaled down, but just as relevant, version of Autodesk University. The caliber of presenters there is bar none. Many of the same presenters have also led sessions at AU. I am looking forward to presenting a session on Autodesk FormIt and hope to see you there!

March is also a great time to begin spring cleaning! I absolutely love when the weather here in Pennsylvania gets warm enough to open the windows and air out the house. Stores have bought into the spring-cleaning craze and offer great deals on everything you "need" to clean and organize your home. If it doesn't "spark joy" pass it along. The dust bunnies will run and hide when they see the vacuum, so be sure to move the furniture to eradicate those little beasts. Everywhere you look, on social media, in magazines, and on television, there will be cleaning gurus offering their best tips and tricks to have your home looking and smelling fantastic, just because it's spring.

This month's issue of *AUGIWorld* is not intended to cause any "madness", but instead, bring Tips and Tricks to help you in your everyday work processes. Our authors have been working diligently behind the scenes to bring you their favorite tips and tricks when working with design software. I hope this issue helps to "spark joy" in your work! We would love to hear your own tips and tricks in our forums and future AUGI articles!

Cheers!

Kimberly

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### Published by:

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AUGIWorld (San Francisco, Calif.)  
ISSN 2163-7547



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# 3ds Max Pro Tip: Use Custom Modifiers

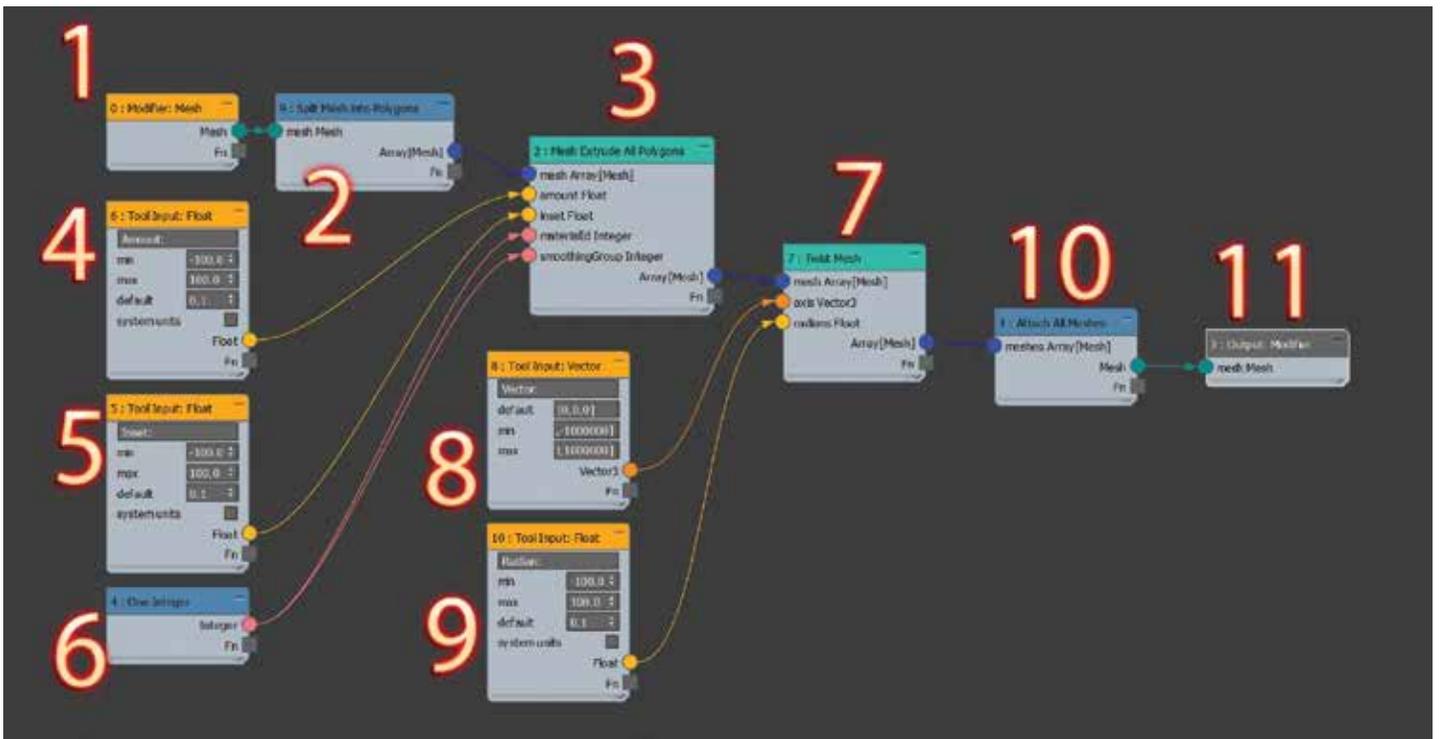


Figure 1 – Max Creation Graph Example

**W**arning! Experimenting with the creation of custom modifiers using the Max Creation Graph can lock up a file in an endless broken loop, which will cause it not to open. If that happens, delete the custom modifier from this location: C:\Users\[user name]\Autodesk\3ds Max XXXX\User Tools\Max Creation Graph\Tools. Deleting the tool should allow you to open the file.

With 3ds Max, we can build custom modifiers. We can use this feature for the construction of procedural buildings, randomization of materials, animation, and more. There's no limit to the modifications and inputs we can add. Additionally, we can eliminate steps we traditionally take through the modifier stack by combining actions into a single custom tool. For example, by combining inset, extrude, and twist into a single modifier that I created, and named "AUGI\_Example". I generated all of the complex geometry displayed in Figure 2 in a matter of just a few minutes.

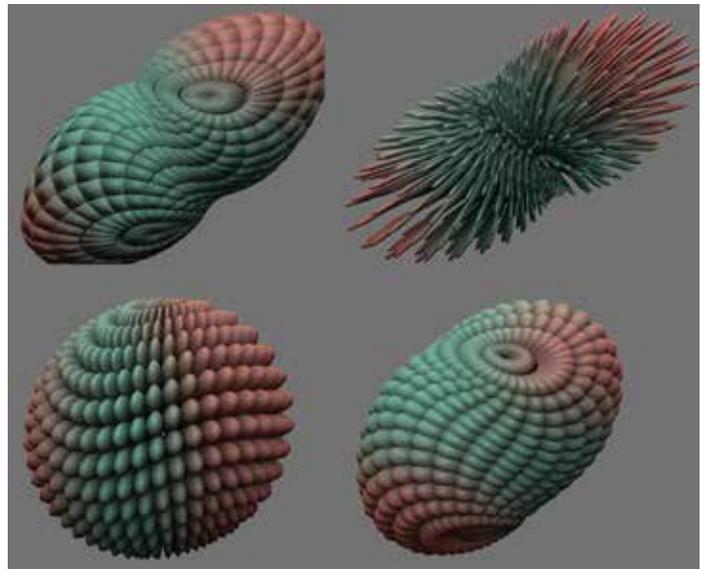


Figure 2 – Complex Geometry Using Custom Modifier

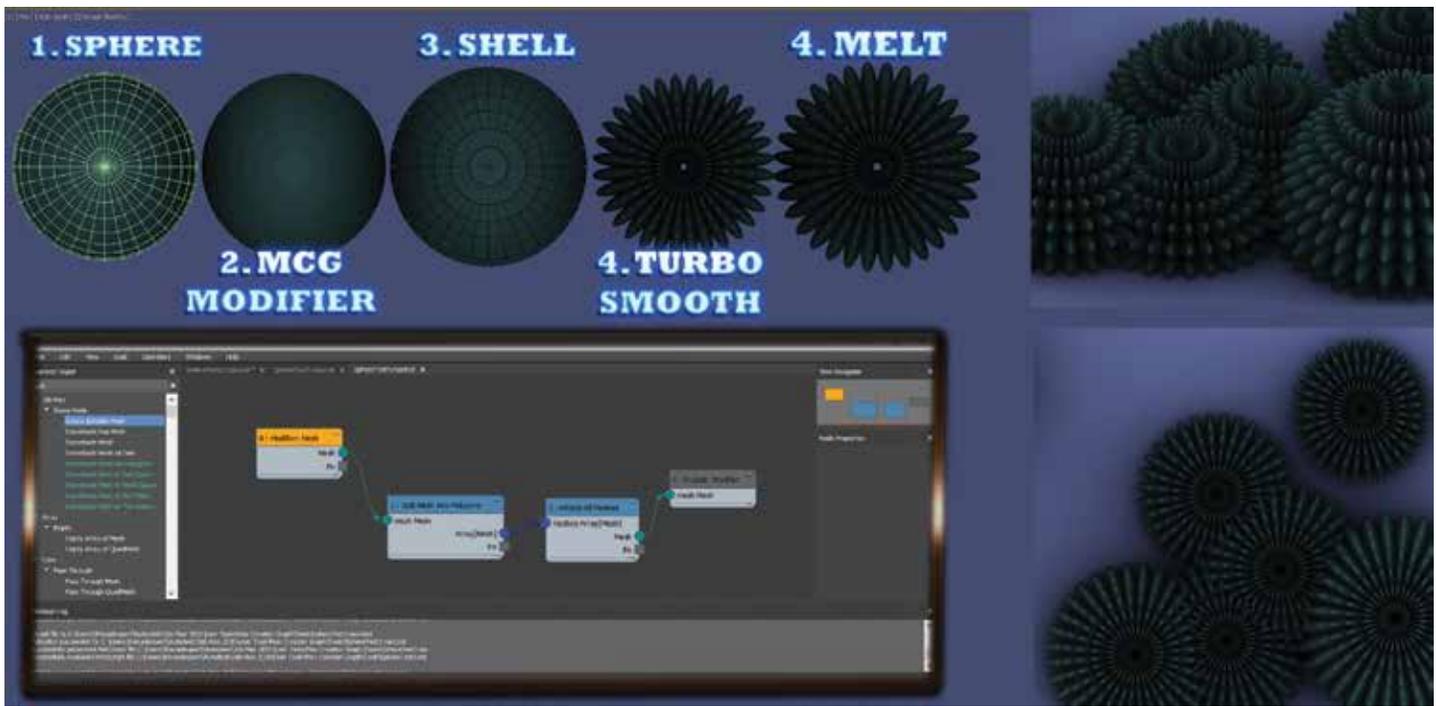


Figure 3 – Custom Modifier in Stack

The simplest way to start experimenting with the creation of custom modifiers is to insert a sphere (or similar object). Then, with the sphere object selected, pick the Create and Apply MCG Modifier option in the Scripting menu. Selecting the option will open the MCG editor, and simultaneously apply a generic graph based on the name you give it. To get you started, I'll explain the modifier I created based on the numbers displayed in Figure 1.

1 (Modifier:Mesh) – The base mesh. This node represents the object in our scene before opening the editor.

2 (Split Mesh into Polygons) – I used this node to split my original sphere into individual faces. The node then outputs a collection of all the faces as individual entities I can influence.

3 (Mesh Extrude All Polygons) thru 6 – These nodes allowed me to apply extrusion options to each of the individual faces by feeding in the collection mentioned above. This node requires user input for the amount of extrusion as well as an inset. To accomplish this, I applied two “Tool Input: Float” nodes. Float refers to the value/number format (as in floating-point format). The extrusion node also requires values for the Material ID and Smoothing Group. So, I applied a “One Integer” node to both.

7 (Twist Mesh) thru 9 – The Twist Mesh Node requires user input for the axis of the twist as well as the amount of twist (in radians).

10 (Attach All Meshes) – After applying the various steps mentioned, I reattached everything.

11 (Output: Modifier) – Required output node is required to complete the modifier.

In addition to creating our custom modifier, we can apply additional modifiers to them. Figure 4 demonstrates a complex object created using a very simple node system that splits the mesh into individual polygons. I then applied the modifiers Shell, Turbo Smooth, and Melt. Doing this, it created the result in the final object displayed in Figure 4.

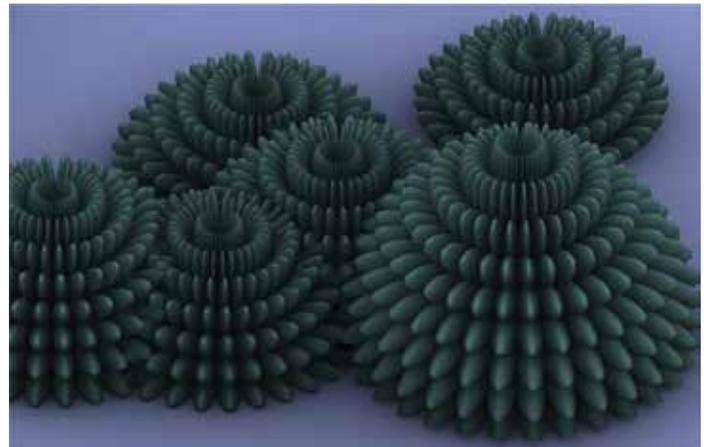


Figure 4 – Complex Object Created using the MCG Editor



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# Create Your Own Photo to 3D Mesh App Using Autodesk Forge



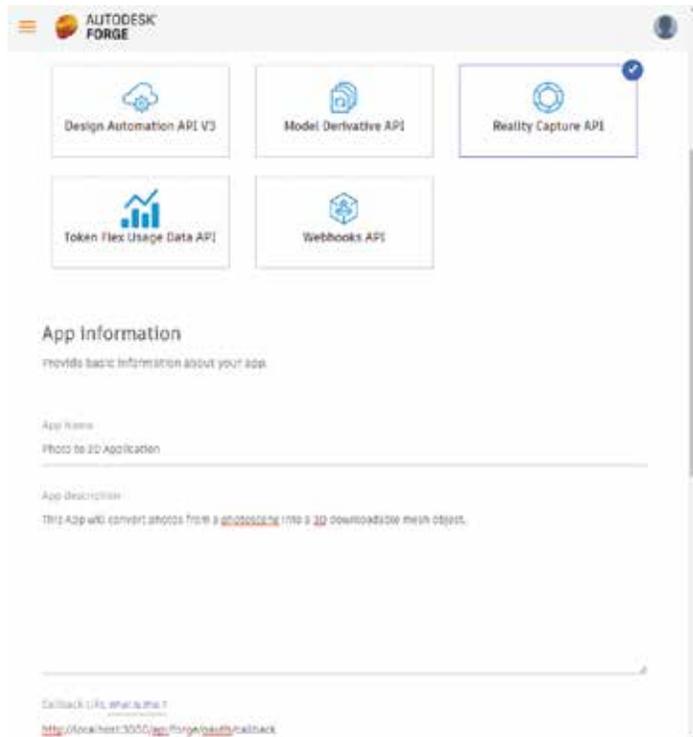
This is an introduction showing how to create a photoscene to 3D image application. It is similar to what Autodesk ReCap would do, but the authentication and processing will be handled in a web browser with the help of Application Programming Interfaces (API's) offered by

Autodesk Forge (It also doesn't use Autodesk Cloud Credits). This allows us to use said tools within our own applications, then to build on, and customize those tools to best meet the needs of a project or an organization.

That being said, keep in mind, this intro is designed as a “get to know you” for Forge API’s. Specifically, the “Reality Capture” API. By the end of this introduction, you will know how to create a Forge app, run a basic web server, authenticate yourself, process a photoscene, retrieve the 3D mesh file, and delete the used photoscene. The introduction will be completed using a photoscene that has already been set up. Naturally, however, those who are using this for their own civil applications will want their own photoscene processed. In response to this, included will be a resource near the end of the article that will allow for expansion on the basics mentioned here.

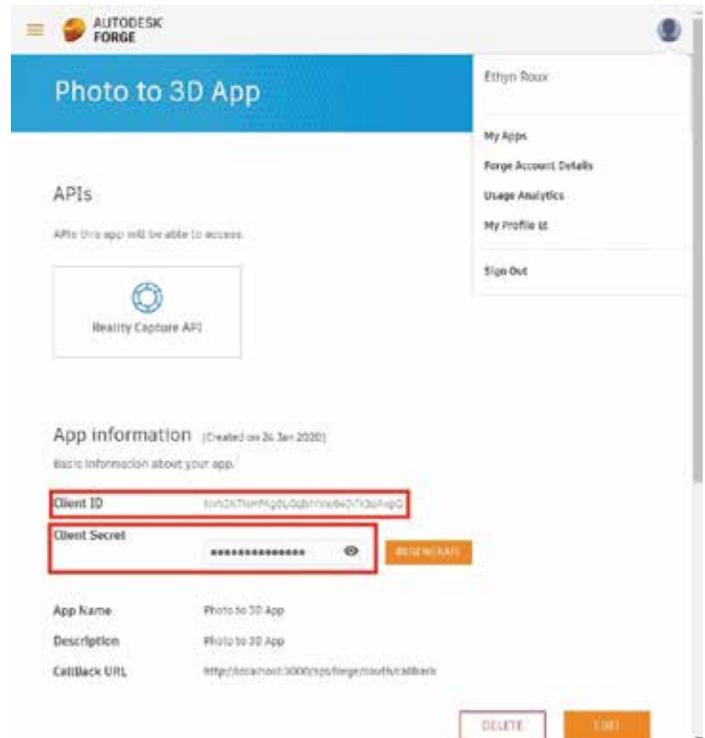
## GETTING SET UP WITH FORGE

1. Before much else is done, we will need to register for an Autodesk Forge account. Visit: <https://accounts.autodesk.com/register> to get started.
2. Next, we will need to create an app with Forge:
  - a. Hover over the profile icon on the top right of the page after creating an account > click “My Apps” > click “CREATE APP”.
  - b. Select the “Reality Capture” API (deselect all others).



- c. Scroll down until you see the “App information” section, and name the app whatever you want. I called mine “Photo to 3D app”. You may also add a description if you’d like.
- d. For the callback URL, enter the following: <http://localhost:3000/api/forge/oauth/callback> (we won’t use it in this app). There isn’t a need for entering in “Your Website URL” as we won’t be needing this.

- e. After the app is created, a new screen will reveal some new App information. Copy and paste the Client ID and Client Secret into a note (we will be using this later).



## SETTING UP THE TEXT EDITOR

\* This step is only necessary if you wish to understand the sample code of the project more in depth. If you have no interest in this, kindly skip to the next section, “The Test Environment”.\*

3. Get a text editor of your choice (Atom, Brackets, Visual Studio Code, etc. Pick one you like the feel of). A quick Google search for each of these will bring you to the download pages, each with their corresponding set up instructions. This will be used to open the source code so you can see under the hood of the source code, so to speak. If you’re not doing anything else with a text editor, Brackets may well be the way to go. It uses the least resources on your PC, is easy to use, and installs quickly.

## THE TEST ENVIRONMENT

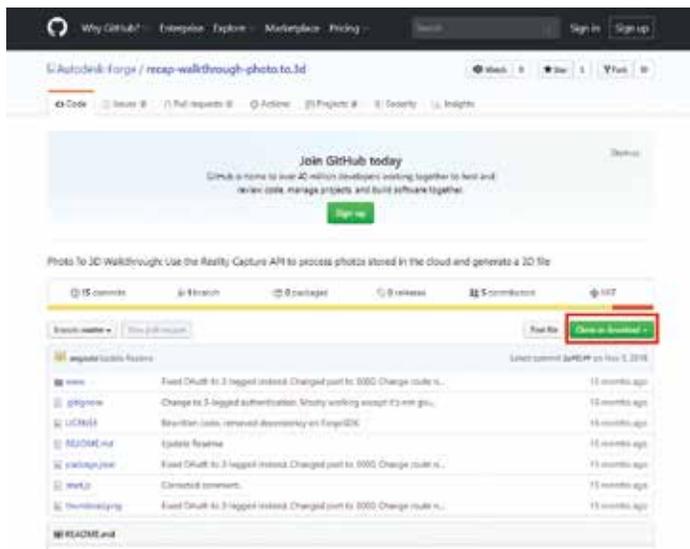
4. To run our simple web server, we are going to need Node.js. You can Install it by visiting: <https://nodejs.org/en/download/>. Once there, we will see a few options. Make sure that “LTS Recommended for most users” is selected. Find the OS you’re using and get the installer for either 32/64-bit, depending on what you’re using (most systems nowadays are 64-bit, so this is a safe bet). Follow the prompts to finish downloading and installing Node.js.

# Autodesk Forge



## SOURCE CODE

5. We are going to need the source code, and associated packages to run our project. So, let's get the source code from github at: <https://github.com/Autodesk-Forge/recap-walkthrough-photo.to.3d>
  - a. Click on the green button that says, "clone or download", and then click "download zip" (we will keep the default name for the downloaded folder). It will ask where you want to store the downloaded file. Make sure it's in a place that you can easily access again.

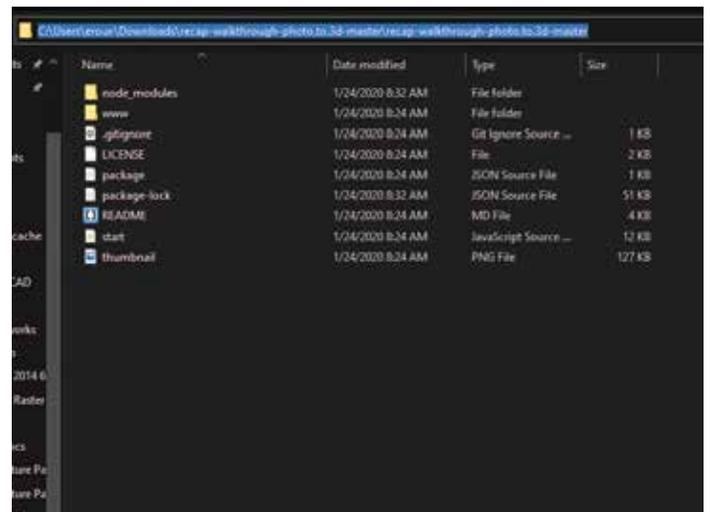


- b. After downloading the zip file, we need to extract it. To do so, go to the newly downloaded file in its location (it should look like the folder has a zipper on it) right-click on it, and click the option to "Extract All..." it will ask where to extract to, and give a suggested path. Just hit "extract" and it will put it in the same location as the initial download.

There are 3 files essential to all of this: Package.json, start.js, and index.html

## PUTTING THE SERVER TOGETHER

6. Open the node.js command prompt by pressing the Windows key and typing "node.js command". It should now show up. Make sure to run this as an administrator, as we will need to install some packages. The easy way to tell is by looking at the title of the command prompt after opening it. It must say "Administrator: Node.js Command Prompt" (Keep this instance of the Node.js command prompt open, as we will need to perform multiple operations in it). Once opened, we need to navigate over to the folder where we put our source code earlier, and grab the folder's address and use it to point our Node.js command prompt to it. To do so, we need to:
  - a. Open Windows Explorer. Then, navigate to the newly downloaded and extracted folder (should have the name "recap-walkthrough-photo.to.3d-master" if the default name was kept).
  - b. There may be a folder within a folder with the same name. Open the folder until all the files can be seen inside of it. There should be: www, gitignore, LICENSE, package, package-lock, start, and a few others. Then, go to the address bar near the top of Windows Explorer and click the folder on the left. This will select the address of the folder you are in and highlight it in blue. Copy the folder address. We will use it right away.



- b. Let's go back to the command prompt. Type "cd", followed by a space, and paste the folder address that was just copied after it. It should look similar to this, but only with your folder path in place.

```

Administrator Command Prompt
Microsoft Windows [Version 10.0.18363.502]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\teresa\Downloads>recap-walkthrough-photos-to-3d-master\recap-walkthrough-photos-to-3d-master
C:\Users\teresa\Downloads\recap-walkthrough-photos-to-3d-master>npm install
npm WARN recap-walkthrough-photos-to-3d@2.0.0 No repository field.
added 349 packages in 1.255s
1 package is looking for funding
  run `npm fund` for details
found 0 vulnerabilities

C:\Users\teresa\Downloads\recap-walkthrough-photos-to-3d-master>

```

- Now that the Node.js command prompt is pointing to our folder, we need to install the packages we just downloaded. Type “npm install” and hit enter. You should get a similar output to this:

```

Administrator Command Prompt
Microsoft Windows [Version 10.0.18363.502]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\teresa\Downloads>recap-walkthrough-photos-to-3d-master\recap-walkthrough-photos-to-3d-master
C:\Users\teresa\Downloads\recap-walkthrough-photos-to-3d-master>npm install
npm WARN recap-walkthrough-photos-to-3d@2.0.0 No repository field.
added 349 packages in 1.255s
1 package is looking for funding
  run `npm fund` for details
found 0 vulnerabilities

C:\Users\teresa\Downloads\recap-walkthrough-photos-to-3d-master>

```

- We will now need to set up the environment variables, using the client ID and client secret we generated earlier when we created our Forge app.
  - Open the note where the client ID and secret were saved, and edit them to look like the following:  
`set FORGE_CLIENT_ID=<<Your client ID here>>`  
`set FORGE_CLIENT_SECRET=<<Your client secret here>>`
  - Copy and paste the edited client ID & secret into the node.js command prompt below all of our previous command, and hit enter. There will not be any response like the one we got when installing the packages. It should just jump to the next line and wait for another command. Take note, the command may even enter automatically when you paste it into the command prompt. If it does this, there is no need to hit enter again. It won't harm if you do though.
- Our next action will be to start the server we spent all this time on setting up. In the Node.js command prompt, type “npm start”. If all went well, there should be a message that says: “Server listening on port 3000”. We can now open a web browser and visit `http://localhost:3000/`. A button will appear saying “Authorize me!”. Continue to click through the links as the app takes you through authorization, adding a photoscene, adding pre-selected files to the photoscene, processing, and then viewing the finished product. Once the photoscene is finished pro-

cessing, a link will be delivered. Just copy and paste that into a new tab in the browser, and your file will be ready for download. Our end product should look like this:



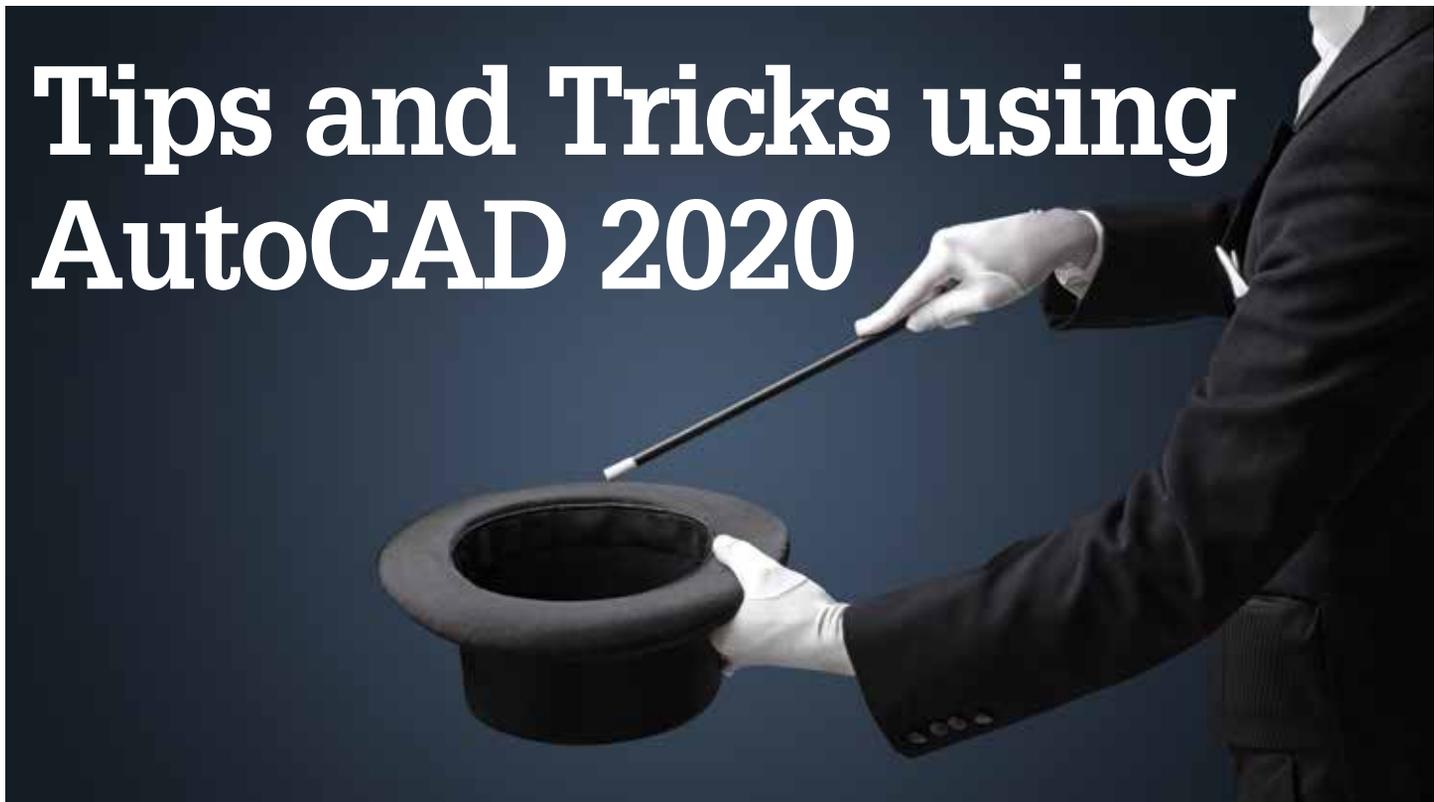
## CONCLUSION

Congratulations! You've just built your own app that turns photos into 3D meshes! Now, this article itself could become excruciatingly long if every nook and cranny about this app was accounted for. And as mentioned earlier, this was purely an introduction. But, to fulfill both my promise made earlier about using your own photos, and the promise to keep this article an introduction, I'd like to add a resource for those of you who are eager to experiment some more on their own time and add their own files to a photoscene: <https://forge.autodesk.com/en/docs/reality-capture/v1/tutorials/create-3d-mesh-from-photos/>

In addition to converting photos to 3D meshes, there are many other things that can be done when we mix survey, and civil data with the power of Autodesk Forge. For example, automating mundane tasks, extrapolating pre-selected types of data, viewing & editing some files online, converting file types, and even customized reports, to name a few. The possibilities really are endless, and hopefully today, we've just opened your mind to some of them. Make use of them. Find ways to use them to make your life easier. Find ways to Forge these API's into your civil workflow.



*Ethyn Roux is an experienced UAS Pilot with a demonstrated history of working in the technology and AEC industry. He is skilled in Surveying, Networking, System Administration, and IT Strategy. He is a strong operations professional working towards a Bachelor of Science focused in Cybersecurity and Information Assurance. He is curious about almost anything, and always willing to help. Ethyn can be reached for questions at [eroux@prosoftnet.com](mailto:eroux@prosoftnet.com).*



**INTRODUCTION**

**A** long time ago....in a workplace far, far, away, I started using AutoCAD. OK, it was not that long ago. But, when I started using the software, I always (and still do) get excited when I figure out something new, or a trick I did not know. Talking to fellow users, getting on forums, and seeing how people solve problems, is a great way to learn. I would grab those *AUGIWorld* magazines and read all I could to see if there was something in there I could incorporate into my workflow. Read on and find out some of my favorite techniques I use in AutoCAD and Civil 3D, one tip and trick at a time.



**ATTIPEDIT**

Have you ever wanted to edit an attribute without going into the dialog box? Normally we would type ATTEDIT (ATE) and select our block and edit. Hold down the CTRL key and select the attribute you want to edit. You will then enter the MTEXT editor to edit your text. You can also type ATTIPEDIT at the command prompt to achieve the same results.



Figure 1

**HPDLGMODE**

This system variable displays the Hatch and Gradient dialog box, and the Hatch Edit dialog box. The variable, by default, is set to 2, which will activate the contextual ribbon. I do like using the ribbon, but I find myself selecting the setting options to bring up this dialog box at the command prompt. Type HPDLGMODE at the command prompt and set this variable to 1 to display the dialog box, as shown in Figure 2.

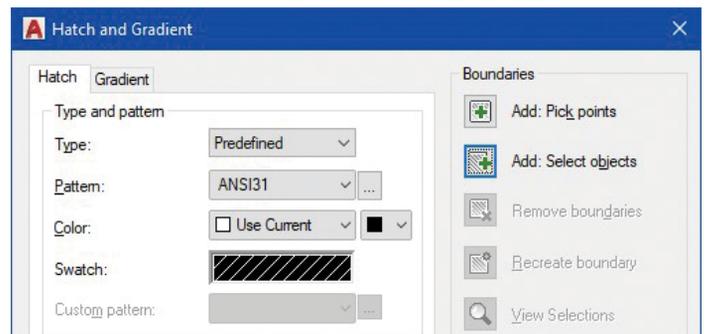


Figure 2

## SNAPANG

Have you ever wanted to use ortho and draw at a specific angle? You can do just that. You can rotate your cursor to draw with ortho on at a specific angle. Type SNAPANG at the command prompt and use your object snap to select the start angle (1), then the end angle (2), and your cursor will rotate to that angle, as shown in Figure 3. Use ORTHOMODE to create parallel lines or add a macro to your tool palette to perform with one click.

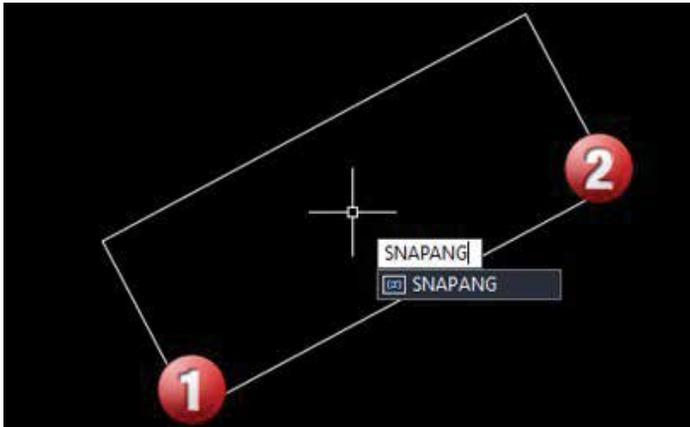


Figure 3

Remember to set the SNAPANG back to 0 when you are done working within that angle.

## STARTUP SUITE

We all have those special LISP routines that we like to use each day. Create a folder. Then, make sure you add it in your trusted locations and add to your briefcase (Startup Suite). Type APPLOAD at the command prompt and add all those lisp routines you like to the startup suite by selecting content, as shown in Figure 4. They will be available each time you load AutoCAD.

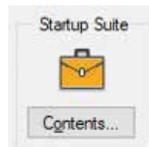


Figure 4

## COPYTOLAYER

Allows you to make a copy of an object to another layer. Type

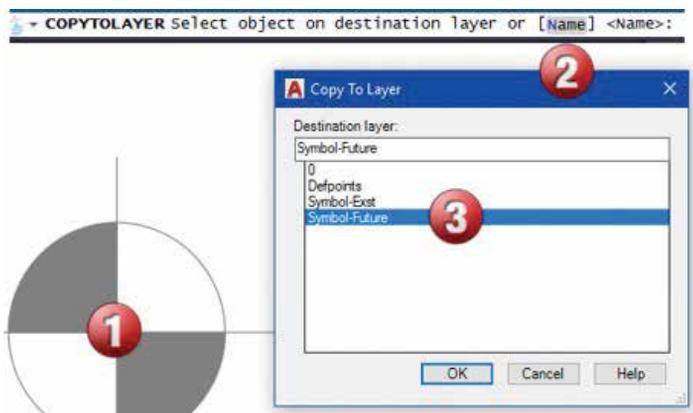


Figure 5

COPYTOLAYER at the command prompt, select your object (1), select Name on the command line (2), select the new layer for the object to be copied to (3), and copy your object to a new location.

## SEARCH LAYERS

Have you ever had a drawing which contained so many layers you became confused? Use the Search File in the Layer Properties Manager, as shown in Figure 6. For example, you want to see all the layers that are on the TOPO layer. Use the wildcard \*TOPO\* in the search.

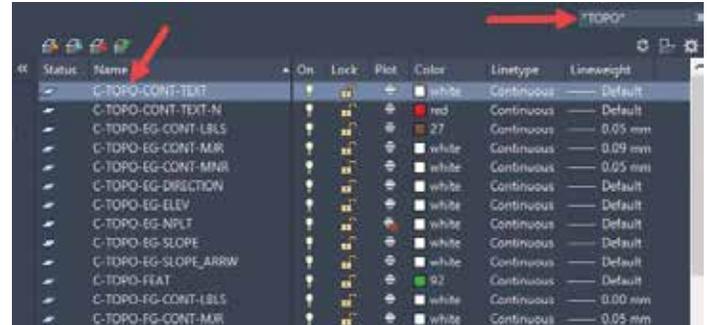


Figure 6

## SAVE BLOCK AS

The ability to take an existing block and make some slight changes to accommodate your design need is awesome. Within the block editor contextual ribbon, to edit your existing block, pull down the saveas off the menu on the Open/Save panel. Now, save the block as a new name. Your existing block will remain untouched and you will now have a new block with the same properties of the existing one.



Figure 7

## FROM TEMPLATE

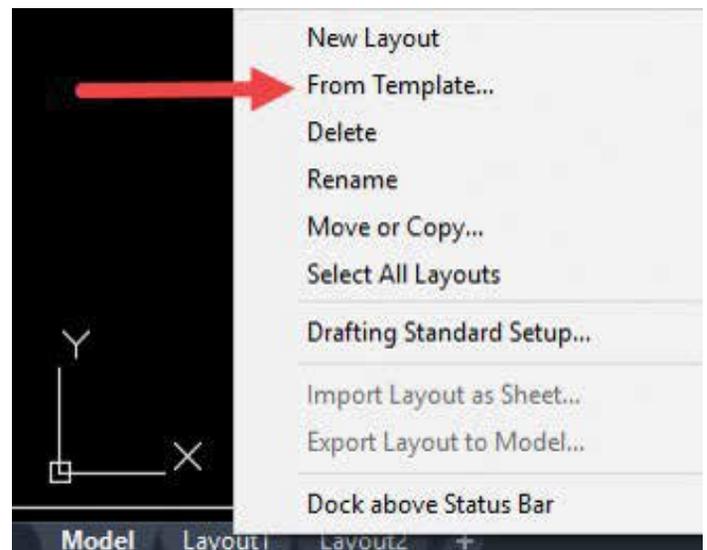


Figure 8

# AutoCAD 2020

This one is a real time saver. Have you ever wanted to just copy the title block and paper space items to a new drawing, or update an older drawing? Don't let the term template distract you. You can select a drawing file from this method as well. Right-click on the layout tab, and choose From Template..., as shown in Figure 8. Navigate out to your .dwg or .dwt file and import the template into a new sheet (layout) in your drawing file.

## TORIENT

Changing the text orientation to Most Readable or 0. Type TORIENT at the command prompt and select each of your text objects (1,2, and 3), as shown in Figure 9. Then, at the command prompt enter 0 and all of your text will line up perfectly with a 0 angle. Try this out when you are trying to orient text to an angled line or object. When you are asked for the angle, use your object snap and select the line you wish to have your text orientated to.

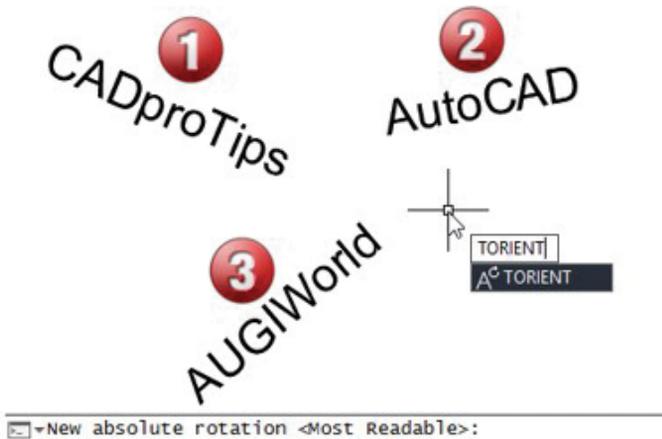


Figure 9

## SUPERSCRIPT AND SUBSCRIPT

Did you know that you can add superscript and subscript to MTEXT objects? Type 1 x 10-2 at the command prompt. AutoCAD can create exponential text values with MTEXT using the caret (^) character. First, create a text object using the MTEXT command, as shown in Figure 10.



Figure 10

Create the caret character after the number, as shown in Figure 11 (2^).

**Note:** For subscript, place the carrot in front of the number, and follow the same procedure. Using the Multiline text editor, select the exponent value, and the caret (left click, drag, and highlight as shown in Figure 11). Then, right-click to view the shortcut menu and select stack.

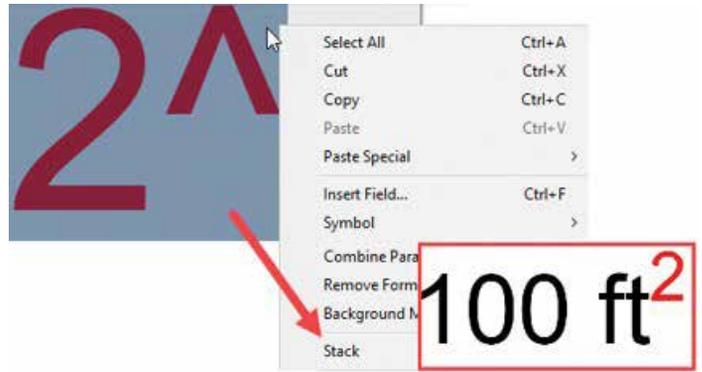


Figure 11

To have additional control over the stacking features, simply select the stacked text, and right-click again. From the shortcut menu, select Properties and the Stack Properties window will appear.

## DELETE THOSE STUBBORN LAYERS

The LAYDEL command has been part of the express tools for a few releases now. What some people are not aware of, is that you can type N at the command prompt, as shown in Figure 12, and AutoCAD will bring up a dialogue box containing all the layers which are currently in your drawing.



Figure 12

## CLEANSCREEN

When using, the screen displays only the menu bar, the Model & Layout tabs at the bottom of the drawing, the status bar, and the command line. Press Ctrl+0 (zero) to switch between CLEANSCREENON and CLEANSCREENOFF. A Clean Screen button is available in the lower right corner of the application status bar, as shown in Figure 13.



Figure 13

## DRAG AND DROP

Did you know you can drag and drop many different file types into AutoCAD? There are many drag and drop features in AutoCAD, and its verticals, that are not documented. Not only can we drag and drop drawing (.dwg) files, you can also do the same with lisp, script, images, pdf, and even text files. Just find the file location and drag into the active drawing window. For you Civil 3D users, notice how I have included a shape file in the image, shown in Figure 13. Yes, you can drag and drop those into Civil 3D as well.



Figure 14

## SHEET SET MANAGER

How can I pass up this opportunity to talk about my favorite productivity tool in AutoCAD? The Sheet Set Manager is your ultimate document management tool. Essentially, every layout is a sheet and you can organize those sheets in a palette, called the Sheet Set Manager. You can effectively edit, organize, and plot drawings as one project. For a more detailed description of this process, please view my class from Autodesk University 2019 named: Advanced Topics Using the Sheet Set Manager. This class has 15 exercises and a full dataset for you to practice with. Don't underestimate the power of Sheet Sets!

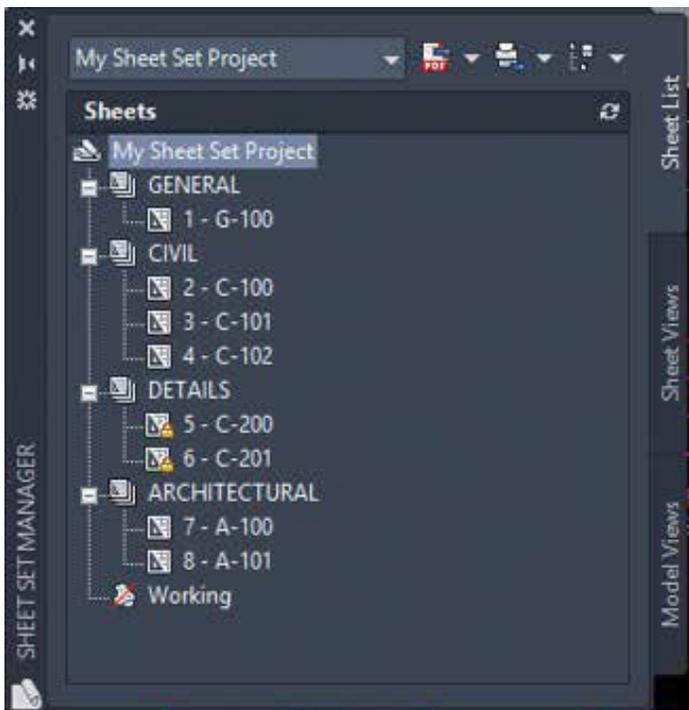


Figure 15

## THE RIBBON

There is a reason why Autodesk stopped the deployment of the Classic Workspace. Yes, you can still get that classic workspace restored but.... we are not going to cover that. Autodesk is constantly evaluating AutoCAD, and how it can improve as technology changes, leading us into the issue of so many users who still create their own workspaces, using toolbars, and that classic workspace. We have become accustomed to one way of working, and that is fine. But, sometimes change is good and creates growth. Many objects in AutoCAD and Civil 3D will activate contextual ribbons that contain many features that are extremely helpful and productive. I encourage everyone to get rid of the classic workspace, and use the Ribbon and all the features that are included. The text editor contextual ribbon is shown in Figure 16.



Figure 16

## CONCLUSION

Learning new software tips and tricks can be so much fun and very productive. Whether you are a rookie or a veteran, we all love our tips and tricks on how to use the software that makes our jobs easier. Listen to everyone when they tell you what they did to solve a problem using AutoCAD or Civil 3D. You might find yourself surprised at some of the cool tips and tricks people figure out while doing project work. We have only covered a handful in this article. But, always remember, nothing is better than learning something new and sharing it with people on your team. It can be a very rewarding experience.



Sam Lucido is a CAD Services Manager with Haley & Aldrich, Inc. He has over 25 years of experience involving design, user support, and customization. Sam is an AutoCAD and Civil 3D Certified Professional as well as an Autodesk Expert Elite Member. He uses his vast knowledge about AutoCAD and Civil 3D to help provide support to engineering and design teams by holding hands on workshops and online training. Sam is a top-rated Autodesk University and Midwest University Speaker. You can reach Sam at [CADProTips.com](http://CADProTips.com) or by email at [lucido1373@gmail.com](mailto:lucido1373@gmail.com)



# Putting it All Together

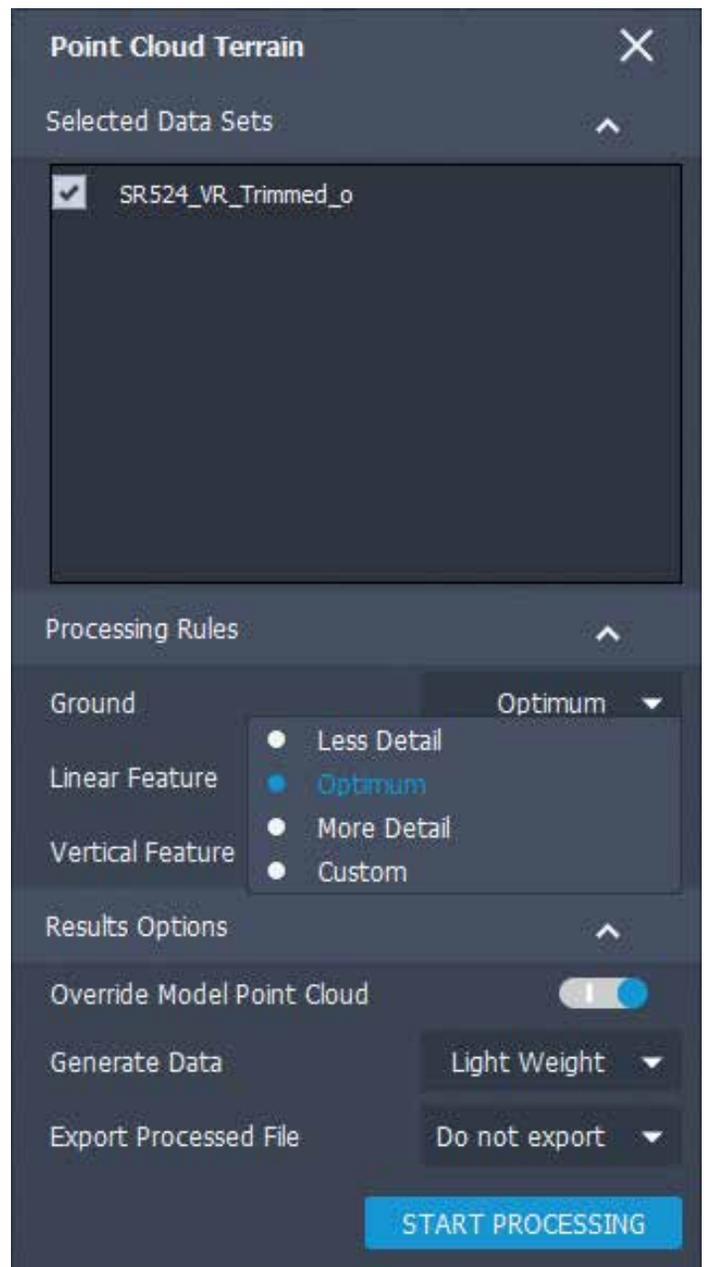
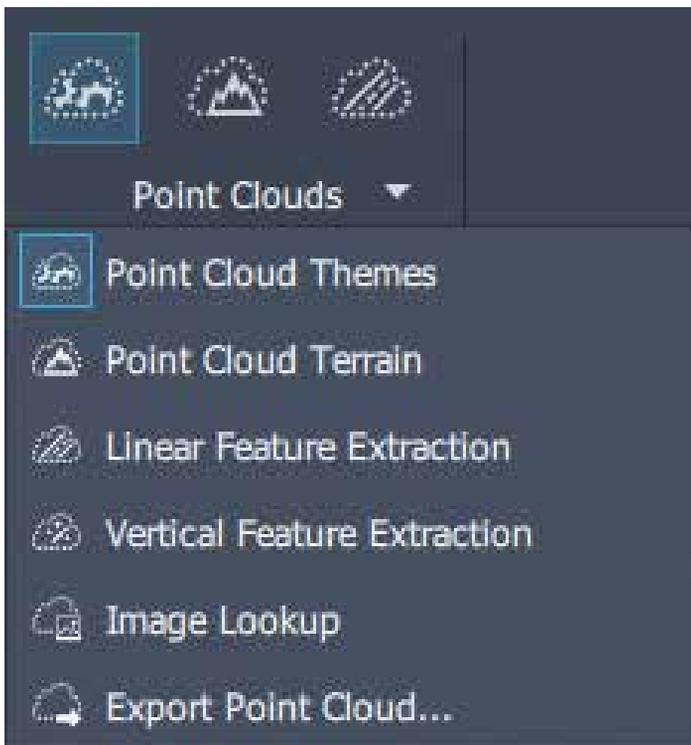
**H**ow many times have you heard this statement: *“Autodesk InfraWorks is an aggregator of data, and there is nothing like it!”* ...I remember the first time I heard it a few years ago. And from that day, I decided to jump into this world of possibilities offered by this fantastic program to help put massive amounts of data into the context of a full infrastructure project. So, let’s dig into how this can be achieved within our Autodesk world.

## POINT CLOUD FILES:

With all the discussion about UAVs and photogrammetry, how can we use the power of InfraWorks to add this data into our existing model? Whether you have processed the information yourself, or it has been given to you, one of the most common files you may have obtained/received will be an .las extension file. Here you will use the power of ReCap Pro to produce a clean and adjusted .rcp point cloud.



1. Within the data sources, add the point cloud. Close and refresh (make sure your coordinate systems are a match from the .rcp file and the InfraWorks model).
2. Create a point cloud theme (elevation preferably) to verify the point cloud data.
3. Depending on your project's scope, and the quality of the data collected, you may use vertical feature extraction to locate elements such as powerlines, mailboxes, signs, etc. This feature is an excellent tool! Unfortunately, I see users frequently underestimate its value.
4. Now it is time to generate the existing surface that this point cloud can provide.

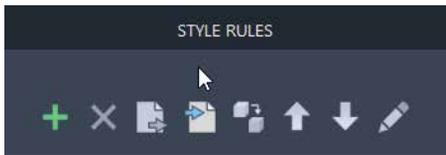
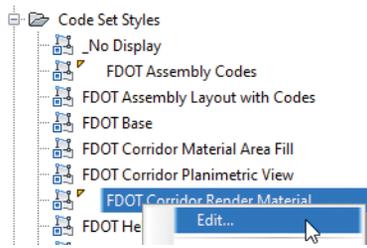


# InfraWorks

## CIVIL 3D CORRIDORS:

For transportation projects, nothing can explain what our projects are, better than a visual representation within the site context. Here are a few basic steps to keep in mind:

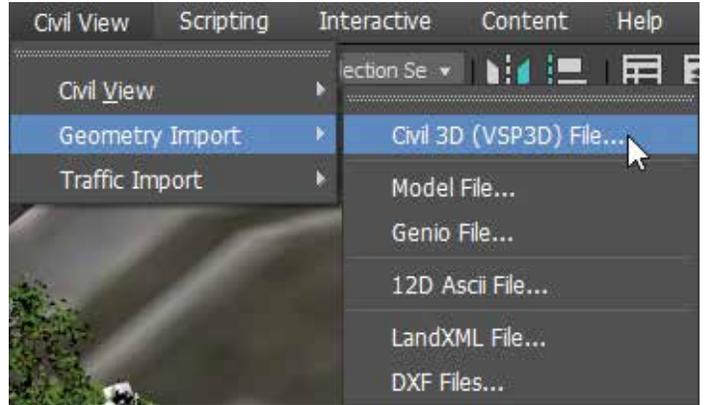
1. Assign render materials to your desired link codes in your corridor model within the settings of the code set style you are using for your project. Please remember that when we attach this Civil 3D model to InfraWorks, any link code containing a render material will create a coverage area in our InfraWorks model based on the link style name assigned.
2. Now that our C3D corridor is good to go, we can then move into InfraWorks and access the style rules dialog box to access the coverage areas tab. You will select all the default rules and delete them. This allows us to create our own based on the C3D corridor.
3. Proceed to attach the C3D file within the data sources panel. When prompted, select the corridor surface, and the corridor coverages displayed in the choose data sources window. Click OK.
4. Now refresh these two new elements in your model; the terrain, and the coverage areas. Don't worry as you won't see anything displayed yet. For that, let's go to step 5.
5. Let's go back to our style rules in the coverage areas tab. We will see the custom style rules that were created based on our link codes assigned in the C3D corridor. Assign materials as needed, and then hit Run Rules to apply these materials to these coverage areas.



## 3D ELEMENTS

1. As an aggregator of data, InfraWorks allows us to bring several types of 3D files into our models, such as .obj, .dae, .fbx, .dxf, and .3ds. I encourage you to create your own content and customize it to the needs of your project's scope. Parametric modeling is an amazing and practical skill I advise many modelers to acquire. Interactive placing is an effective way to bring many of these elements in, while not compromising the accuracy and context of what you want to show.
2. Revit elements can be attached to the InfraWorks model the same way. Make sure that if your Revit model is geolocated, the coordinate system and units are a match to the model properties in the InfraWorks environment.
3. 3ds Max is perhaps one of the most underused tools in the AEC Collection due to the learning curve many people think they need

to follow. The combination of InfraWorks and 3ds Max can provide realistic detail for projects that makes them come alive for clients and stakeholders. Autodesk University 2019 had great presentations on this topic. I encourage you to watch sessions CS323313 and CES322532, where you can view the full potential of what you can achieve using this powerful software.



[https://www.autodesk.com/autodesk-university/au-online?facet\\_event\[0\]=Las%20Vegas&facet\\_year\[0\]=2019&facet\\_product\[\]=urn:adsk.content:content:0e1af96b-7177-4568-b328-58a2c7ff4ba9](https://www.autodesk.com/autodesk-university/au-online?facet_event[0]=Las%20Vegas&facet_year[0]=2019&facet_product[]=urn:adsk.content:content:0e1af96b-7177-4568-b328-58a2c7ff4ba9)

## OTHER ELEMENTS

The process to import other extension files is similar. This can be achieved by following the prompts provided by the data center tabs, depending on the type of file you wish to attach. There are many more processes we could discuss using different project scopes and context - to mention just one: "Virtual Reality". I don't want to leave you hanging here, so I encourage you to check out this interesting workflow from John Sayre from a few years ago. This demonstration will show you another incredible potential use in design visualization.

<https://www.youtube.com/watch?v=fj0HTJkOy2Y>

Happy modeling everyone, and don't hesitate to email me with questions! I am glad to help.



Oscar Castaneda, PE, is a transportation planning and design engineer for CONSOR Engineers, with an office in Winter Springs, Florida. As a 3D roadway engineer, His 3D design expertise is demonstrated by his selection as an instructor at the past four Florida DOT Design Expositions. With more than 15 years of industry experience, he has led the charge for a seamless, highly beneficial integration of cutting-edge 3D technology into the firm's design techniques, process, and product. You can reach Oscar for questions and comments at: [ocastaneda@consoreng.com](mailto:ocastaneda@consoreng.com)

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# Revit Tips and Tricks for the Non-Power User

**P**ower users always get the glory, and they love tips and tricks. As CAD/BIM Managers, we love trying to find ones that will blow people's minds. What we fail to remember a lot of the time is, not everyone is a power user. There are the rookies right out of school who really have only been using Revit for like 20 hours in total and have had no real-world experience. Then there are engineers and designers who use it daily. But, have no training in it and are excited to create a section. They need and want to do more without totally messing up the model.

These tips and tricks are for them; the “new Revit” user, the “old to design, but new to Revit” user, or those who “just want to maybe pick up one more, super sweet nugget of information” user.

Here are a few of my favorite tips and tricks I have shared with my team over the last year or so. These have saved time, blown minds, changed people's workflows, or at the very least, kept the grumbling down to a dull mumber.

## KEEP IT UP TO DATE!

In the fast-paced world of Design and Consulting, and with new software updates & versions coming out at a frantic pace, it may seem impossible to keep up to date. Not only with the current version of Revit, but also the updates to older versions you may be using at the time. Since we all know that not every client is using 2020.2.1, or by the time you read this, the next update has come out and I am now behind.

It is important though to make sure you keep yourself and your users up to date and current. Many problems part-time users have can be solved right off the bat with the simple question, “Is your Revit up to date?”. Keeping it up to date is easy with the Autodesk Desktop App. No, it is not going to update everything for you or install the latest version all by itself. It still takes a bit of effort on your part. It easily allows you to see when your Autodesk software has updates, or there are new versions waiting to install.

Keep in mind, if you have put off installing the newest version, there is a good chance there are already updates ready to load. So, make sure you go back and check for updates after a new install. A little trick handed down to me, is to set up a calendar reminder to check your app once a week, and if there is anything to install, do it right away. One install is a lot better then getting behind and having to do 5 or 6. Remember you cannot use Revit while it is updating.

If it is not installed on all your team's machines, get it on their desktops, and start checking it.

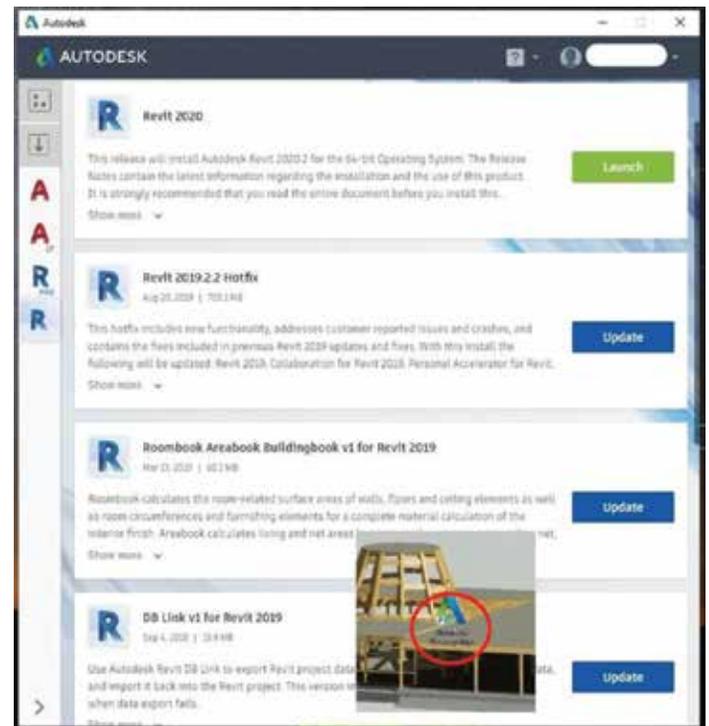


Figure 1 – Autodesk Desktop App.

One more other little gem you may want to make sure you are doing, is to adjust your file naming to allow for the version of Revit that file was created in. As a consultant, we are at the wishes of our client, and they may be one or two versions behind. There is nothing worse, and time consuming, then having to try to open a model 3 times, in 3 versions of Revit before you get it right.

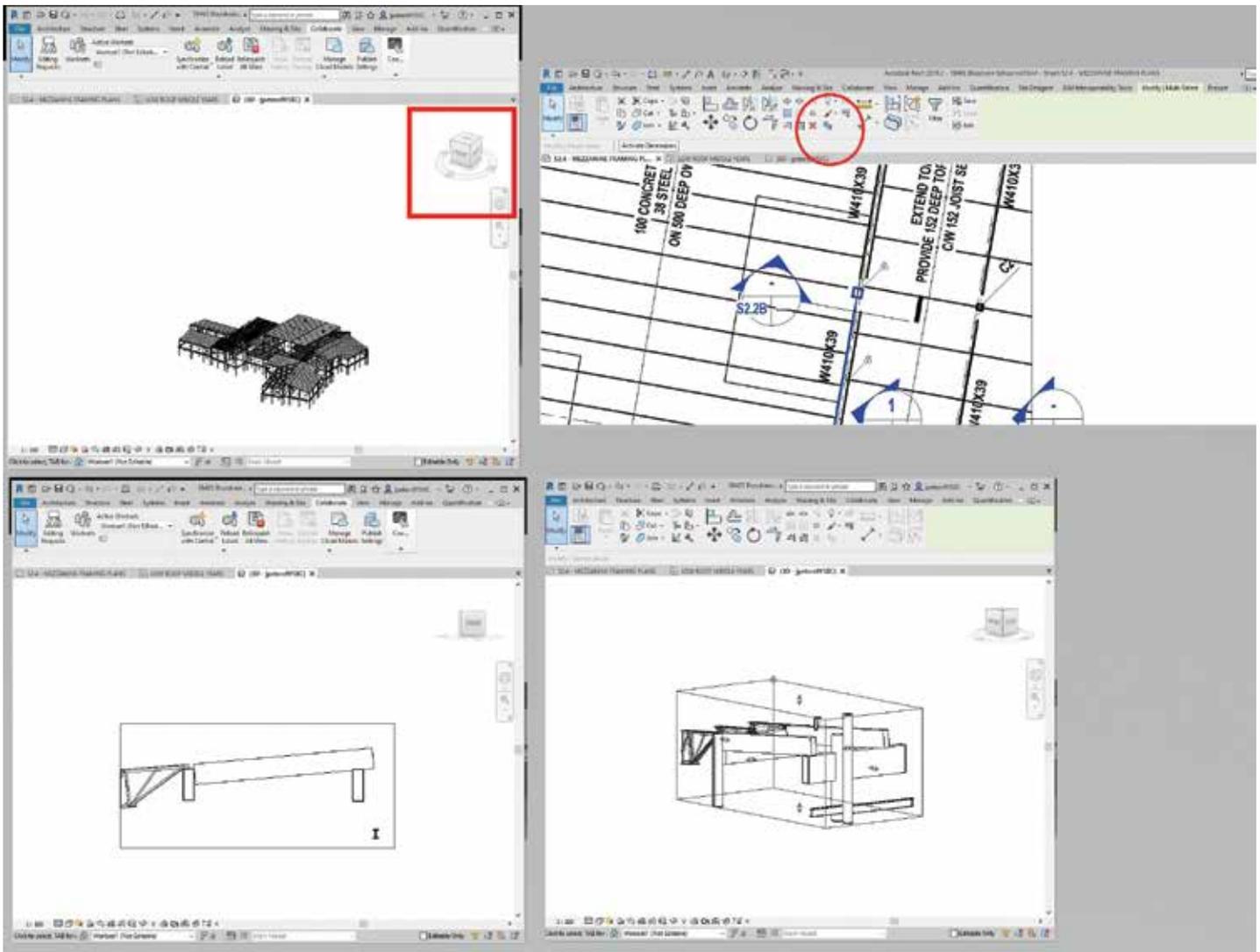


Figure 2 – 2D to 3D views.

## I WANT TO SEE THAT IN 3D PLEASE?

Working closely with designers and engineers, it is a daily occurrence to have someone lean over and touch a part of the plan I am working on, or the section we are trying to flush out and ask, “I want to see that in 3D please”. Or from across the office you hear, “I like this section, where in the model is it?”

First off, this will always tend to leave a nasty fingerprint on your screen. Or in the worst case, a nice pen line across your monitor. Yes, grumble about a dirty screen, the request is easily dealt with two ways; using the view cube or the selection box (BX) tool.

If you are great at naming your Sections and Elevations, using the View Cube in your 3D view is a great way to jump to the view of a specific section, elevation, or plan. First off, to go to a 3D view, right-click on the View Cube (fancy square in the top right corner, and select “Orient to View”. Select the view type you want to see (FLOOR PLAN, ELEVATION, etc.). Then finally, select the view which you want to see in 3D. Bang it goes to the view you want to see. But initially it does not look 3D-ish. That

is because it is in the view you have selected such as section, elevation, etc. Do not panic. Just start panning in your view. You will then start to see it in 3D. Really it is the view you selected, plus the view depth that it is set to. Want to see more depth or size? Just select the clip box and use the blue handles to move the depth. And there you go, that section or elevation is in a 3D view.

The other easy way, if you are discussing something on a plan view or in an elevation, is to select the item or items you are wanting to view in a 3D view. Then, under the Modify tab, select SELECTION BOX. Or if you are a keyboard short cut guru, type BX. There you go, a 3D view of what you need to discuss. If the view range is not what you need, select the section box, and use the blue handle to adjust the size of the view. Keep in mind, this is a cropped view of your Default #D View. To return to the overall 3D view, uncheck the “Section Box” under “Extents” on the “Properties” palette.

These two simple shortcuts to 3D views should make it so much easier when reviewing and coordinating on a project. And hopefully this will keep your screen clean and free of scratches and pen lines.

# Revit Structure

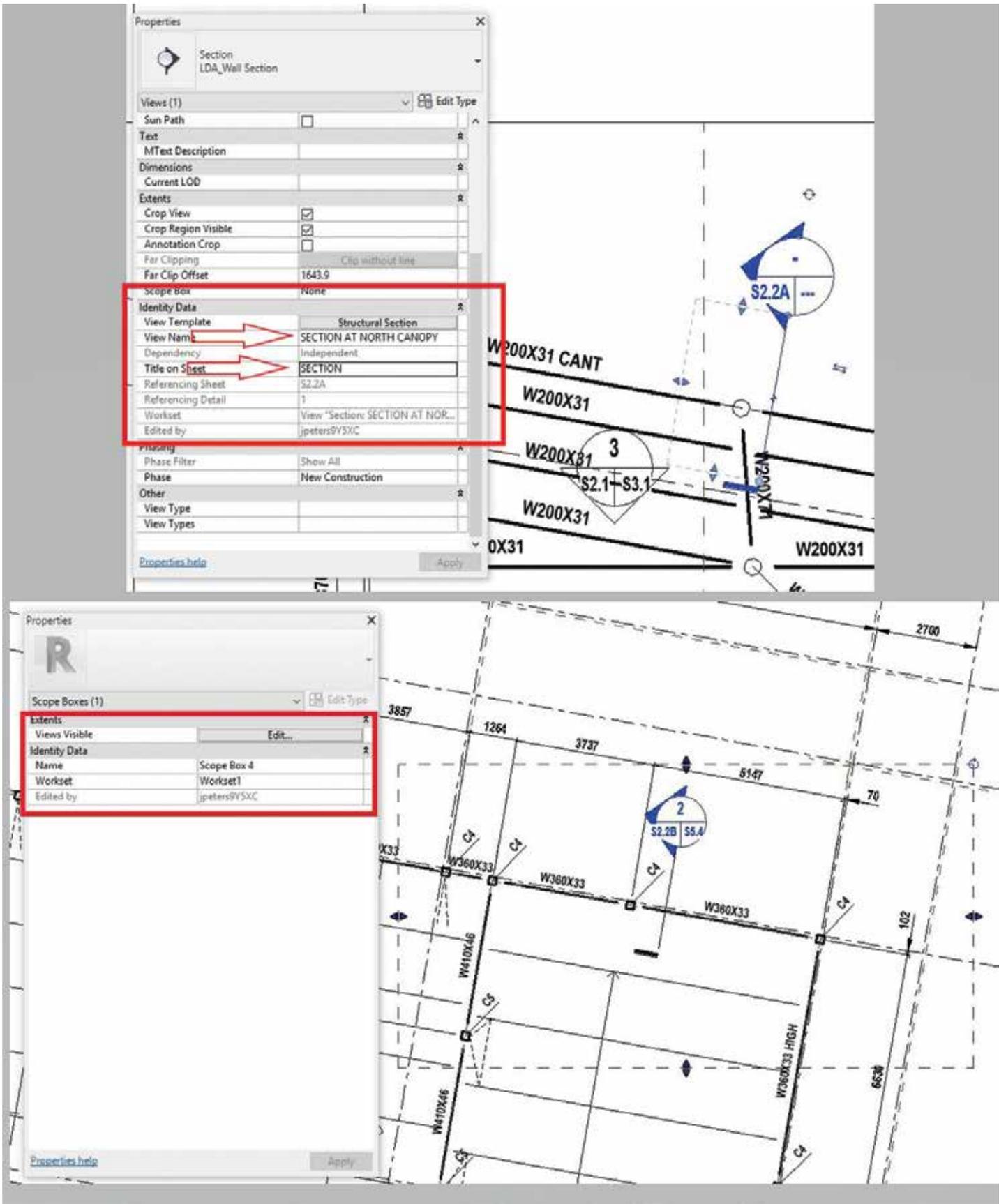


Figure 3 – Name your views and items.

## NAME IT!?!

Revit is great for letting you create things; lots and lots of things. From reference plans, to sections, to plans, to families, to groups, and on and on. Sometimes it seems like you can spend your day just creating things and then hunting for them later.

Going into someone else's project and not being able to find anything, or have no idea how things are organized, can make jumping into a project already underway very frustrating. Have fun trying to create the 3D view we just talked about when all the sections are named SECTION 1 through SECTION 65. Or, trying to set up plan view with a scope box, and all the names are SCOPE BOX 1 to SCOPE BOX 12. I think you see where I am going with this.

There are not many times in Revit that when you create something, it does not give you the chance to name it. Or, after you have created it, it allows you to change the name to something else.

So maybe instead of SECTION 1, it can be SECTION 10/S2.2 AT CANOPY OVERHANG. Or, instead of SCOPE BOX 1, it can be PLAN AT CANOPY. One of the great things about Revit is if you need to, or want to change it down the road, you always can. Quickly changing view titles associated with the section or plan, as well as keeping the plan or section view name descriptive and allowing you to change the "Title on Sheet" to something more standard like just "SECTION".

So, just do it. Take the time early in the project to name a view, or section, or scope box, or reference plane. Knowing that with proper naming and organization now, you or another team member will not have trouble finding or referencing unnamed views and items later in the project. Remember, the more care and coordination you do upfront in Revit, the easier the project becomes as it progresses.

## WHAT HAPPENED TO MY GRID LINES?

Ever extend a grid line or an elevation line only to notice later it no longer shows up on a plan or a section? Yes, it is an easy thing to fix once you figure out which elevation or which plan to adjust them on. But why does it happen?

When extending a grid line or a level line in plan, elevation, section, etc., always check to see if it is in 2D extents or 3D extents. 2D meaning, what you do to the extents of the Grid/Level Line only happens in that 2D view. It does not affect any other view. 3D meaning, what you do to that Grid/Level Line will affect all other views and planes.

For example, if you are in a section and you select a Grid Line that is in 3D extents, and you drag it up above your main floor framing plan, that Grid Line will no longer show up on any plans below its lowest point. Such as basement or foundation plans.

Once you get your levels and grids set at the beginning of the project, it is highly recommended that you pin them and leave them alone. If you must adjust them in a view down the road, make sure it is in 2D extents, or you will have to go back and re-adjust it. Just follow these quick guidelines and you should not have to worry about it again.

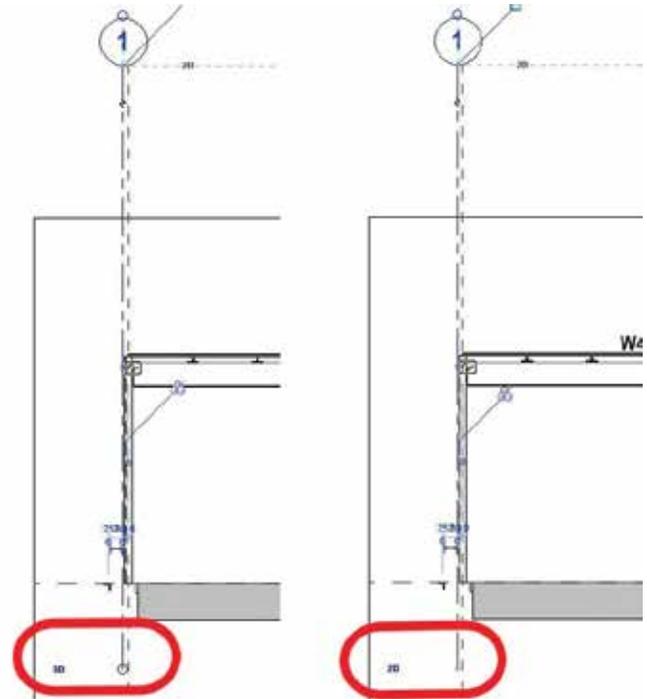


Figure 4 - 2D vs 3D extents.

## WHY CAN I NOT MOVE IT JUST 4 INCHES?

If you work solely in metric, you can just skip over this one. Here in Canada, like other parts of the world, we work in both the metric and imperial system, meaning we switch back and forth between saying things such as, "this block wall is 190 thick" in one project, to saying "the same block wall is 8-inches" in another. It sounds confusing, but you get used to it. That being said, when working in an imperial project, if you want to move your beam over 4-inches, you cannot just type in 4, hit enter, and boom it is moved 4-inches. It moves it 4-feet. This becomes very frustrating for new users, users who do not use Revit a lot, or those who are used to working on a metric project. With imperial, you will need to put in the foot (') and inches (") symbol. So, if you want to move an element 1'-6". You have to enter it as 1'-6", 1'6", or 18". If you can do the math quick, then 1.5.

These are not the only options, there are a couple ways around this. The simplest is just get used to having to input the foot (') symbol all the time. Or, you start to use the space bar more in place of the symbols. Meaning for 1'-7 3/16" you would type 1<space>7<space>3/16 enter. Or if you are good with fractions on the fly, it would be 1<space>7.1875.

# Revit Structure

Another way would be to change your project units to fractional inches. This has drawbacks as well, such as changing all your units, including dimensions and temporary dimensions, to fractional inches. This makes it a bit easier to work with if you don't mind converting every distance you want to move something by, to inches. The downside is you will have to change the properties of all your dimensions to show them in feet and inches, not project units. This also means now your temporary dimensions will be in fractional inches.

I personally would recommend getting all your users used to using the space bar option. You do not want to be changing many things in your project template when you switch from metric to imperial.

## I WANTED ALL THE COLUMNS EXCEPT THAT ONE?

Crossing windows are a great thing for selecting multiple items at once, so is holding down the control button to select (left mouse button) items one after another. But, imagine you have selected all your columns & a couple of beams, and all you wanted was one column type. Great. No worries. I can unselect the beams by using the filter button and unselecting structural framing. Awesome. All we have left is Columns. Wait! I only wanted 9 of the columns, not the 12 that are selected. Now what? Or as we all do, we zoned out while selecting multiple items and pick one or two or nine of the wrong things. No problem. Do not hit the magic ESC button and start again. Just use the SHIFT button as the opposite of the CTRL button. Hold SHIFT, then start selecting all the items you want unselected. What is so great about it is, if you go too far and unselect something (admit it, it happens), just go back to CTRL and start selecting.

I am just going to add this last tip here on selection. We have all been interrupted for the urgent call of "I want to see this in 3D" and have made all our selections and you quickly just hit ESC. Or, click in the white space and run for help. Maybe you have just moved a bunch of beams/columns, etc., and you moved them the wrong amount and really wished there was a way to reselect everything again. Well there is. You can right-click, select "select previous", or you can use the keyboard short cut of CTRL "right arrow".

## I DID NOT MOVE THAT?

Yes, yes you did! You did not mean to or want to. But yes, you moved that. Other than pinning it, which is the obvious solution, you can also make sure you do not move it again mistakenly by turning off your "Drag elements on selection". What this means is, once it is turned off, you will physically have to select an item before you can move it.

You can find this in the ribbon under the Modify tab, which is always there, and unselect "Drag elements on selection". Or, you can go down to the lower right corner and make sure "Drag elements on selection" is red X'd out. You can also change the other selection options in those two spots. Feel free to try them all out and set it up how you like.

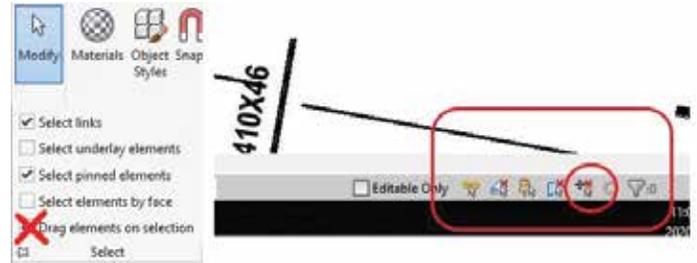


Figure 5 – Selection Options.

These are just a few of the many tips and tricks that are out there. The more you can share with your team, the easier Revit will be for them, and the more productive they will be. Do not settle with just using the help features in Revit. There are many great resources out there. AUGI.com has a great forum and Autodesk has the Autodesk Knowledge Network, (knowledge.autodesk.com). Both are full of great advice and places to ask your questions. Or, do the Google thing. You will be surprised at what is out there, and what Revit can do. Listen to your users. They will surprise you and have a bunch of little tips and tricks they know that will blow your mind.

Feel free to contact me with your mind-blowing tips and tricks or questions. I would like to hear from you. Together we can make Revit easier for all of us.



*Jason is the BIM Manager at Lavergne Draward & Associates. A Structural Consulting Firm in Winnipeg, Manitoba Canada. Jason has over 20 years of experience in Structural Consulting using AutoCAD and Revit as a drafter, modeler, coordinator, team leader, and CAD Manager. In his current role as BIM Manager, Jason is responsible for implementing and maintaining BIM, and modeling standards. As well as providing technical support and training for both AutoCAD and Revit users, and continues to enjoy the challenges of daily production work. He can be reached for comments or questions at [jpwpgcad@gmail.com](mailto:jpwpgcad@gmail.com) on Twitter @JP\_WPGCADGUY or LinkedIn.*

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# Revit Build Machine (Part 1)

**I**n my capacity as both the IT Manager for my company, as well as a long-time Revit user myself, I have had the normal struggles with management over the years with the need to provide machines for our Revit users that are both sufficiently capable, as well as sufficiently inexpensive. For years, we had to use machines for our primary Revit users that were over 5 years old, and weren't even the speediest models to begin with, because management didn't want to spend the money upgrading the machines. Over the years though, they've come to accept that it is necessary to keep their Revit users productive, rather than have them sitting there waiting on the spinning icon to go away.

But, there is still the argument regarding how much money is too much to spend on keeping the Revit machines as compatible as possible. Is \$4000 too much to spend on a machine? In our owner's minds, yes. Is \$1000 more reasonable? Sure, but are you going to get a machine for that much that will keep your users as productive as possible? In fact, yes you can! We went through this exercise several years ago and discovered there actually was a way to get a machine that was as capable as the \$4000 one, but for only around \$1000 for the hardware. How did we do it? We built them ourselves.

The \$4000 machines we were looking at were liquid-cooled, overclocked Intel processor machines that were purpose-built by a computer manufacturer specifically for running Revit. When management immediately rejected that idea as too costly, we started looking for alternatives. Since I had built my own computers before using stock parts from local retailers, I started looking at what it would cost to build a liquid-cooled, overclocked Intel processor machine myself that met our needs. Using parts I could buy from a computer retailer like Newegg or from Amazon, what I discovered was that I could build that same machine, buying all the components from local or online retailers, for around \$1000, not including software.

In the retail world, where we'll be getting our parts, most of the important components we use are those typically used in high-end gaming systems. That's because, just like Revit, high-end gamers want the most speed they can get out of their machines. However, we're going to pair some of that down because we're not trying to impress the gaming community with the coolness of our build, and we just don't need that much video card or power supply. And let's face it, we're not trying to shoot the other guy before he shoots us.

Here are the different components necessary for the build, and my reasons for choosing them:

## PROCESSOR

Revit is still almost completely a single core, single thread application. So, the massive number of processor cores on the typical high-end processors really do nothing for Revit. The most important characteristic of your processor, where Revit is concerned, is the clock speed. The more clock speed it can give you, the better. For the highest clock speed, you need to go the route of Intel's Core I line of processors, specifically the Core I7's or the Core I9's. And, to increase that clock speed as high as possible, we decided that an overclockable processor was even better. On our current builds, we use the Intel i7-9700k processor.

I've found that the I9's tend to be less about increasing the clock speed than they are about increasing the number of processor cores, and other things that do not benefit Revit. For example, if you look at the specs for an I7-9700k, and the specs for an I9-9900k, the processor clock speeds are almost identical, but the cost is around \$100 higher for the I9, and you're paying extra for features that won't benefit Revit at all.

## MOTHERBOARD

To take advantage of the overclocking capability of your processor, you have to choose a motherboard that is made for overclocking the processor. That means you have to look at the “chipset” (or Northbridge), and choose one that starts with the letter Z. The one for the core I7-9700k is the Intel Z390 chipset.

Most motherboards these days come with either 2 memory sockets or 4. In my experience, go with a motherboard that has 4 memory sockets. That will allow you to add the amount of memory you need now with two memory sticks (dual channel), and still leave two sockets empty for the future if you ever need to add more.

If you can add a few more dollars to your build budget, there is a type of solid state hard drive called an M.2 PCIe SSD that is much faster than a standard SATA SSD. But the motherboard has to have a socket specifically for that. But in my experience, most boards that have a Z chipset will usually have at least one of these. It is worth the extra money for the drive if you can swing it.

Whichever motherboard you decide to use, be sure to get one that has at least three fan headers. If you can find a motherboard that has two CPU fan headers, that will be even better (for liquid cooling, more on that later).

## MEMORY

Next, to the Processor. The memory is the second most important component where Revit is concerned. Not only is Revit a processor intensive application, it's also a memory hog. And if your machine doesn't have enough memory for the complexity and size of the models you work on, it will slow your machine to a crawl, or worse. I recommend that any Revit machine have a minimum of 16GB, but we prefer 32GB. And, buy the fastest speed of memory you can afford, and that the motherboard will support.

I have found it prudent to provide memory in two equal size memory sticks (2 x 8GB for 16GB total, or 2 x 16GB for 32GB total) to take advantage of the better performance from dual channel configuration. And as I mentioned in the motherboard section, if you have 4 total memory slots that will leave two of the slots open for future needs.

## DISK DRIVE

The type and size of your disk drive can have a huge effect on the overall speed and capability of your machine. Do yourself a huge favor and spend the extra money for an SSD (Solid State Drive) instead of the older and cheaper magnetic disk drive (HDD). The speed difference between a solid state drive and a traditional magnetic hard disk drive is huge. No matter how much you spend on the fastest processor and memory you can buy, it will mean nothing if you put a magnetic hard disk drive in it.

As discussed in motherboards above, you can get an even greater speed increase, for anywhere between \$50 and \$100 dollars more, by going with a PCIe M.2 SSD. These are drives that come in the form of a circuit board that is long and slim, with pins on one end that slip into the M.2 socket on the motherboard. However, M.2 drives come both in the faster PCIe standard, and also in the slower SATA standard. So, if you want the added speed increase, make sure you buy a PCIe M.2, not a SATA M.2. You'll see an example of an M.2 installed in the build pictures I've included.

Regarding the capacity of your SSD, I started out with these builds putting 240GB or 256GB drives in, thinking they would be enough. However, over the years, I have now had to replace all of those drives with larger drives. So, I'm now putting 480GB or 500GB drives in my machines.

## COOLER

For all of our builds, I chose to go the route of liquid cooling. I'm talking about All-In-One liquid coolers (AIO for short). They all come pre-assembled with a water pump that is already attached to a radiator with two hoses and has the liquid already in it. You don't have to attach the hoses, nor do you ever have to add liquid. And, the liquid never spills or leaks out. There are fans that are attached to the radiator that bring cool air from outside the case through the radiator carrying the heat from the processor away.

They come in different capacities that are based on how big a radiator you want. For instance, typical sizes are 120, 240, and 360. These numbers refer to the nominal length of the radiator, based on how many 120mm diameter fans it's designed for. The 120 refers to one 120mm fan, the 240 refers to two 120 fans side-by-side, and the 360 refers to three 120 fans side-by-side. I've had heat issues with 120 radiators. 360s are overkill for what we need and would take a monster size case to fit it. So I've stayed with the more common 240 size.

## VIDEO CARD

Revit is far more dependent on the processor than the video card, but it can make use of a quality video card for things like rendering. We don't use any of that at our firm. Being a MEP engineer, we go for lower-end video cards than say, an architectural firm might want. Now, every motherboard out there in the consumer world has on-board video with output ports built in. Those will do fine for additional monitors to put things like Excel & Outlook, or web browser windows. But, for your main Revit model screen, I recommend you get a discreet (separate) video card.

We've had good luck with what we need to do with inexpensive (around \$120) 2GB cards with either NVIDIA GeForce or AMD Radeon chips. If you do a lot of rendering, feel free to spend more for something much higher, but you'll have to be the judge of that.

# Revit MEP

## CASE

Cases come in all kinds of sizes, colors, materials, and configurations. You can decide for yourself on color & style. Configuration is what I'm going to stress here. And that is mostly to do with the liquid cooler radiator. As I stated in that section, I have been using liquid coolers with 240 radiators. The radiator has to mount to the case at a location on the outside wall of the case that is made for fans/radiators so it can pull cool air in from outside the case. You have to find a case that has a configuration that includes mounting spots for a 240 radiator (or 2-120mm fans mounted side-by-side). Most often, that is at the front of the case or at the top. I prefer the front. I've tried cases where the radiator mount is at the top, but I've run into issues with the radiator and fans in that location interfering with the memory sticks.

And, with front mounting radiator, you'll probably want to avoid cases that have an external drive bay for an optical drive. Even if the case has front mounts that would seem to fit the 240 radiator, the drive bay mount on the inside usually interferes with the radiator. The photos I've included are from an early case I used that did have external drive bays, but happened to be big enough where this wasn't an issue.





## POWER SUPPLY

Notice I put the power supply at the end. About the only thing we need to discuss with these is the wattage. I've found that 500 watts is enough, and I usually get something that's 500 watts to 650 watts depending on what's the least cost that day. The only thing you might alter for your build that may require higher wattages, is if you need a higher-end video card.

These are the various components that I've been using in these custom-built Revit workstations for the past 4 years. And so far, they've worked out great. Here are some photos of a couple of the machines I've built.

Even with hardware specs and models changing over the years, I can still build them for between \$1000 and \$1100. That doesn't count software costs. Obviously, with this being a build from scratch, it will not have Windows on it like a pre-built machine from a computer manufacturer. So, you will have to purchase Windows and install it yourself.

In closing, if you want a good machine to run Revit without spending your entire IT budget, and you're willing to build it yourself, you can get the same performance without the high cost. And if you've never built a computer before, but you'd like to give it a shot, in Part 2 of this article, I'll go into much more depth for those who may not be comfortable yet going inside the guts of their computer case.



Travis L. Head  
IT & CAD Manager  
Reed, Wells, Benson & Company  
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*For the past 11-1/2 years I have been the entire IT & Network Administration Department, and CAD Department Manager, for a 55 person MEP Engineering firm in Dallas, Texas. Prior to this position, I worked as the IT Manager, the Autodesk Software Coordinator, and an Electrical Designer for another small MEP firm, also in Dallas. I've been responsible for the initial Revit implementation, installation, setup, and training at both companies. I've been building Windows PC's for over 20 years and have been building overclocked & water-cooled workstations for Revit for the past 5 years.*

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**CONSTRUCTIONLINES**



[https://apps.autodesk.com/ACD/en/Detail/Index?id=6678732553206347993&appLang=en&os=Win32\\_64](https://apps.autodesk.com/ACD/en/Detail/Index?id=6678732553206347993&appLang=en&os=Win32_64)

Autodesk AutoCAD  
Version: 2020, 2019, 2018, 2017  
Autodesk AutoCAD Mechanical  
Version: 2020, 2019, 2018, 2017

Creates a construction line of infinite length. A “block” and “xref” are selectable too. You can set the layer freely. There are 23 commands.

- \* Horizontal construction line (CLH)
- \* Vertical construction line (CLV)
- \* Cross construction line (CLC)
- \* Select 2points construction line (CLA)
- \* Construction line parallel to entity (CLEP)
- \* Construction line perpendicular to entity (CLEV)
- \* Construction line parallel to 2points (CL2P)

- \* Construction line perpendicular to 2points (CL2V)
- \* Two divided distance construction line (CL2D)
- \* Equally divided distance construction line (CLND)
- \* Two divided angle construction line (CL2A)
- \* Equally divided angle construction line (CLNA)
- \* Offset construction line (CLOF)
- \* Offset distance collective input.
- \* Sample: 50,100,150,200 50,200\*5,100 \*\*\*
- \* Rectangle construction line (CLRC)
- \* Intersection of entity (CLIP)
- \* Divided calculation Lite (CLDCL)
- \* Circle construction line (CLCI)
- \* Concentric circle construction line (CLCC)
- \* Tangent construction line (CLTP)
- \* Touching a circle construction line (CL2T)
- \* Erase all construction lines (CLE)
- \* Select and erase construction lines (CLES)
- \* Construction lines layer setting (CLS)

**TAG LEGEND**



<https://apps.autodesk.com/RVT/en/Detail/Index?id=2597869698847820293&appLang=en&os=Win64>

Autodesk Revit  
Version: 2020, 2019, 2018, 2017

This application allows Autodesk® Revit® users to place a tag for Legend Component and keep the tag updated automatically.

By using this app, Revit users can also input door & window information to door & window type parameter automatically such as: number of instances, level, sill height, room name.

Trial Description: The 30 days trial with full functions will be active immediately after installing the tool.

**FLIPPER**



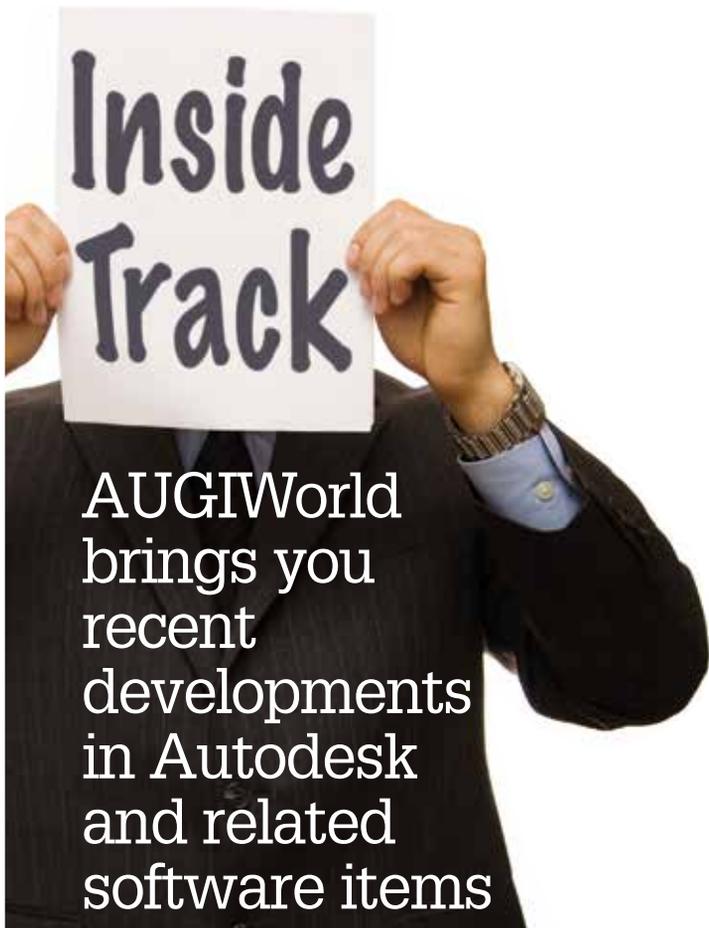
<https://apps.autodesk.com/RVT/en/Detail/Index?id=4825202806152148653&appLang=en&os=Win64>

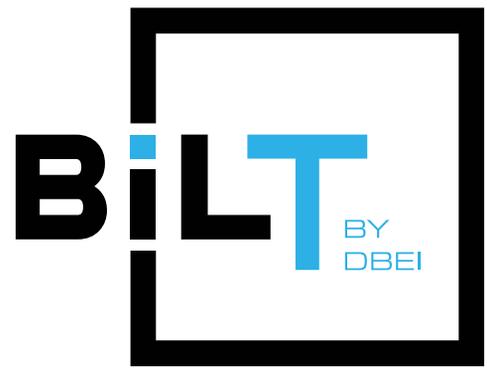
Autodesk Revit  
Version: 2020, 2019, 2018, 2017

While placing the host-based elements from the Ceiling Plan or Floor Plan, sometimes our components are not in the same direction as we expect. We end up in a situation, where we manually flip the work planes of all elements. This version tool allows the user to select multiple elements and flip the work plane all together.

By default, if we wish to rotate multiple selected elements, we use SPACE key which rotates elements by 90 degrees. Using the rotate feature of this app, the angle for bulk rotate can be specified.

If you have some news to share with us for future issues, please let us know. Likewise, if you are a user of a featured product or news item and would like to write a review, we want to know. [brian.andresen@augi.com](mailto:brian.andresen@augi.com)





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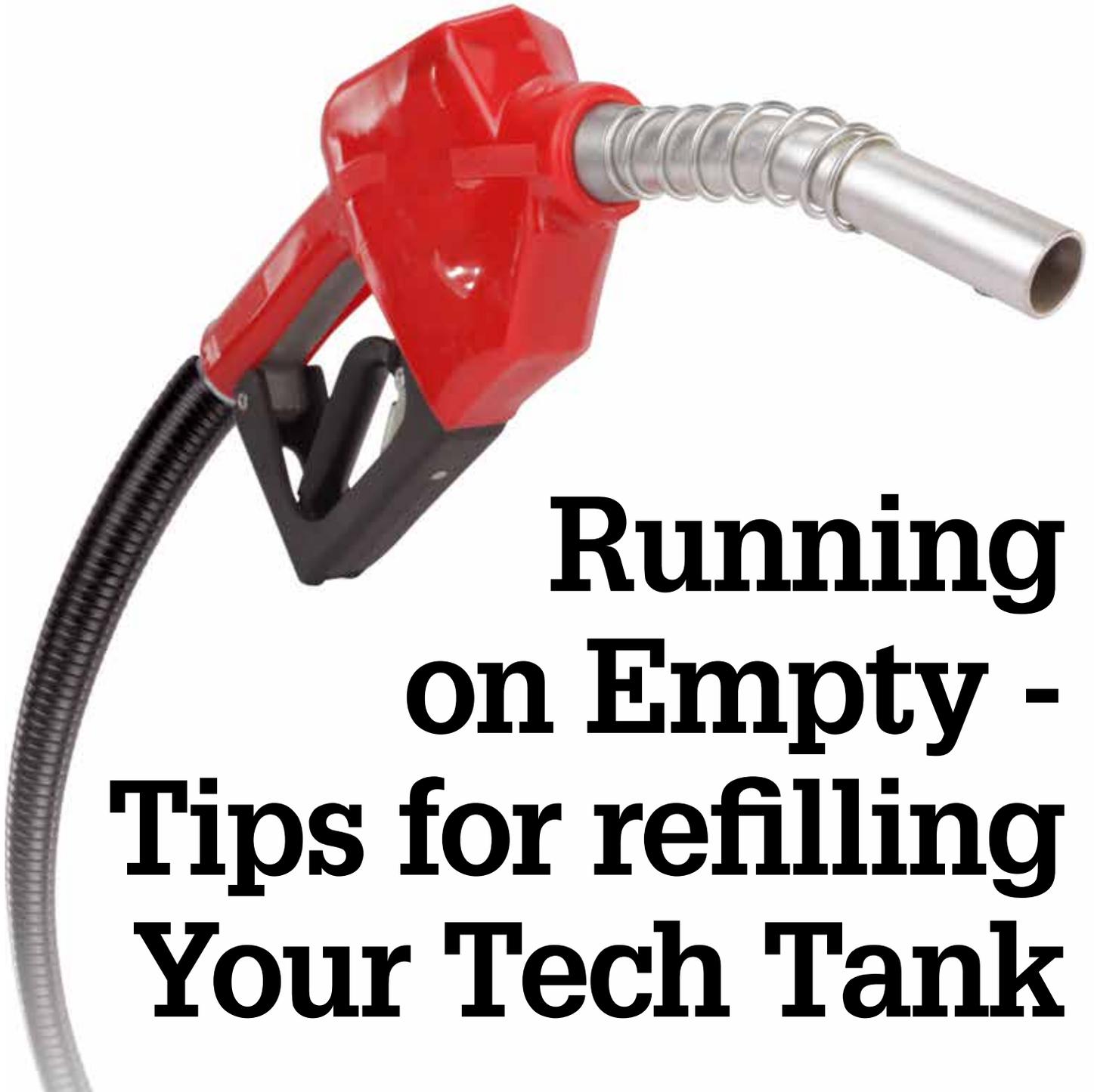
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# Running on Empty - Tips for refilling Your Tech Tank

**L**ast month, I asked, "What Have I Done for You Lately?". I talked about what you have been doing for others and your company. I encouraged you to write down everything that transpires, because you do so much that it might be easy for you (and others) to forget. I suggested keeping a journal and tracking accomplishments (not to brag), but to remind others of your value. It also helps you remember key dates and decisions. Then you can answer those that tend to forget how often you help others.

Now, I move on to what you can, and should, do for yourself. Don't forget to provide what you might need to reinvigorate your efforts, sharpen your focus, or bring clarity to your visions of the future. Let's take a quick stab at what you might want to do for yourself.

You have a personal Tech Tank that gets filled and then gets used, and used, and used. You need to refill it so that you are not running on empty. Just like the gas tank in your car, sometimes we have a full tank and can make some great progress. Other times it seems like we are running on fumes. Personal disclosure: I run way past

empty all the time in my car. The estimated range for miles I can drive my car, tells me, has gone to zero many times and I just keep driving. I take it as a challenge to see how far past “empty” I can drive. This may leave me stranded on the side of the road if I guess wrong. May it never be like that with my tech skills, knowledge, and desire. I want a full tank. I do not want to run on empty. I do not want to be stranded.

We all go through flat periods in our work life. Things just don't ramp up the way we expect. Cycles are expected. But snapping out of them should be our focus. Our “Tech” accounts, on many levels, need to be refilled and topped off so that you can draw on those resources when we need to fuel the future. Your tank gets drained as people need technology support and efforts from you. You must fill it from time to time to ensure it is there when you need it most.

## TIPS FOR REFILLING YOUR TECH BANK ACCOUNT

### Research Some Tech

Tech changes so quickly that we all need to stay up with the latest trends. We have to do it with purpose. We have to follow up on innovative ideas no matter where they come from. I have followed up on leads from junk emails (no – I did not click the links, I searched apart from the email). I chase down ideas that are mentioned in meetings. I make notes about something that was said in passing on a webinar. I dig into items that family members mention at holidays or birthday parties. I investigate things I hear on the radio, TV, or while surfing the web. I do not spend hours doing it. I may see that some ideas are out of our league, rather than quickly move on. Others may take more searching. But I do the research, the reading, and the pondering. As I do this, the needle moves a little from E to F.

### Buy Some Tech

Moving from research to purchases for the entire firm is a first step. When you look at technology and find something that might benefit the company, you need to get your hands on it. Buying technology tools needs to happen on a small scale at first. It might be a trial version or you may have to buy it. Your budget should have some funds devoted to R&D (if you followed my advice from the budgeting articles in the past). Now is the time to spend that funding. Get copies for yourself and if it looks promising, get copies for others and get their input.

### Play with Tech

Whether you get it free, buy it, or already have it, you need to actually play with tech to get a good feel on if it will work for your environment. As you know, not every tool does what it claims to do. Not every tech supplies what you might need. There are tons of features and many processes that might be improved, but unless it scratches where you itch, it may not be a good fit. Some of the best advances I have made is with software and hardware we already own that is not used to its fullest. I dig

and dig into the tools that we use every day and review the features list months after an upgrade to see what we may be missing out on.

### Get Yourself Something

Get a new phone. Add a second or third monitor. Upgrade your laptop. Buy that software utility to address that lingering little annoyance that you keep putting off. We usually are good at budgeting and buying technology for the firm and others, but we may seldom buy something just for ourselves. Don't forget to treat yourself. Seeing what new tech can do for you personally can open your eyes to things that might work for others.

### Delegate More

Need some free time for the above items? Then ask others to help by taking on some of your load. Even if they do not work for you, there are others in your firm that would love to help you get your job done. Define some things that can be delegated to others. There are plenty of people that can do an excellent job of making progress on your initiatives. Allow them to do some research. Ask them to test out new tools. Get them to try another process that you think might be a better way. Let them have input.

### Do the Obvious

Get some training. Video training, online webinars (you must get as many email invites as I do). Attend an event in your local area. Full day or half day, these can be a gold mine when you need to see what is happening in technology. Join a User Group, listen to a peer give a talk. Talk to others at the events and compare notes. Take a mental health day, just go to the park with the kids.

Take some time to rejuvenate your skills, perspectives and focus, as well as, time to play with the tech tools that may soon define the future of your firm. Move your needle fully to “Full” so that when you are called on to make tech progress, you have what it takes to get to your destination.



*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](http://www.caddmanager.com) and [www.bimmanager.com](http://www.bimmanager.com).*



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