CS324061

Revit for MEP Fabrication: The Process from Start to Finish

Bryan Strecker
MB BIM Solutions

Learning Objectives

- Set up and utilize Revit MEP Fabrication Parts and assemblies to create various shop drawings to be utilized in the field.
- Demonstrate the use of Fabrication CADmep to develop custom Revit Fabrication Parts for each project.
- Explore 3rd Party Revit Add-ins that can facilitate faster workflow in creating accurate 3D models.
- Discover efficient modeling strategies for getting the most out of Revit.

Description

This class will teach MEP subcontractors how to set up and use Revit software for MEP modeling, coordination, and fabrication. Having developed this service from scratch, we'll offer a unique perspective on the process from start to finish. We'll start by learning how to set up Fabrication Parts in Revit, adding custom parts to our catalog, and we'll discuss efficient modeling strategies using these new parts. We'll then explore add-ins and software that are helpful in the coordination process. Finally, we'll discuss useful coordination drawings, spooling drawings, and how to create these so they facilitate a simpler workflow in the field.

Speaker(s)

Bryan Strecker received his master's degree in Mechanical Engineering from the University of Kansas in Lawrence, KS in December of 2012. Bryan then moved to Colorado and spent three years in the Oil and Gas industry utilizing AutoCAD Plant 3D and CADWorx, then making the switch to the AEC industry in 2016. In his time at MB BIM Solutions he has worked as a consultant, utilizing Revit in a variety of Structural and MEP projects and developing the Revit MEP modeling services. He has explored the requirements of MEP subcontractors in an effort to develop more sophisticated shop drawings for use in the field. He has also worked as the lead in Navisworks clash coordination, giving a unique perspective in the project process.

Goals for the project: Shop Drawings

The overall goal of our projects has been to produce drawings that can be used in the field to install fully coordinated MEP systems. Thus far, we have had our focus on Plumbing, Duct, Mechanical Pipe, and Electrical models. We would like to eventually get into fire protection, such that we can facilitate the entire coordination process in one place. However, we are still learning and haven't dove into this quite yet.

The various shop drawings we have produced thus far include piping layout plans, hanger plans, slab penetration plans, 3D isometrics, and spooling drawings. The piping layout plans are fairly straight-forward, showing the locations of pipe or duct with respect to grids, also calling out the service and elevation. These are the main drawings used to lay out where everything is routed. This drawing works well because it closely mimics the design drawings, so the installers are familiar with the format and can seamlessly begin using the drawings. One of the drawbacks is this drawing can get quickly cluttered as it tries to dictate everything there is to know about the pipe. With condensed systems, this drawing needs the aide of other drawings to fully explain the routing.

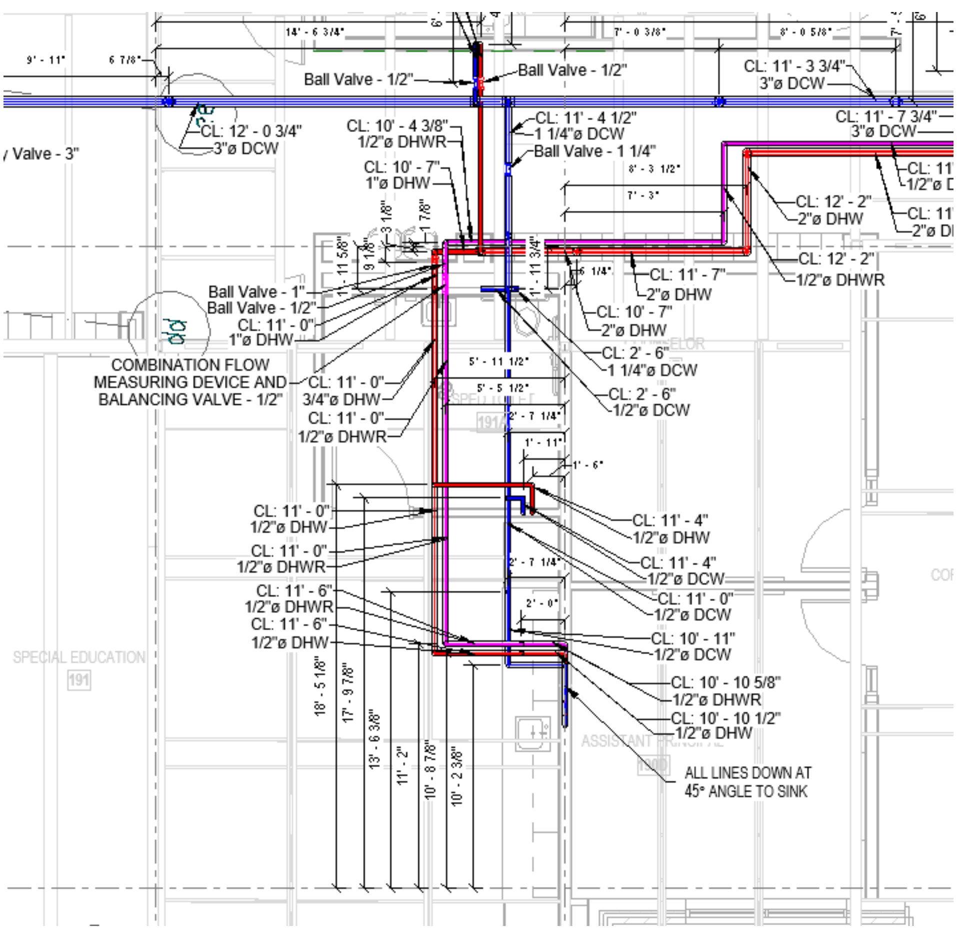

Figure 1: A portion of a domestic water piping layout plan.

Hanger plans and slab penetration plans are used in their most basic form to lay out exactly where hangers and slab penetrations are located. The hanger drawings give elevations for either centerline or bottom of pipe (depending on what the field would like to see), as well as locations in plan view for where the sleeves and hangers are with respect to grid. These drawings also give the size of the lines in question. We have found that a few of our clients prefer even simpler drawings for each step in the installation process. This meant reducing the information given in hanger drawings down to simply giving the size of the line, the service, and the relation to grid for each straight run of pipe. Using this drawing, the field can simply walk these locations and install hanger anchors in the slab prior to being poured. Likewise, slab penetration drawings can be as simple as showing the pipe or sleeve size and relation to grid for every penetration in a given area. Once again, the main goal is to keep things simple for the field.

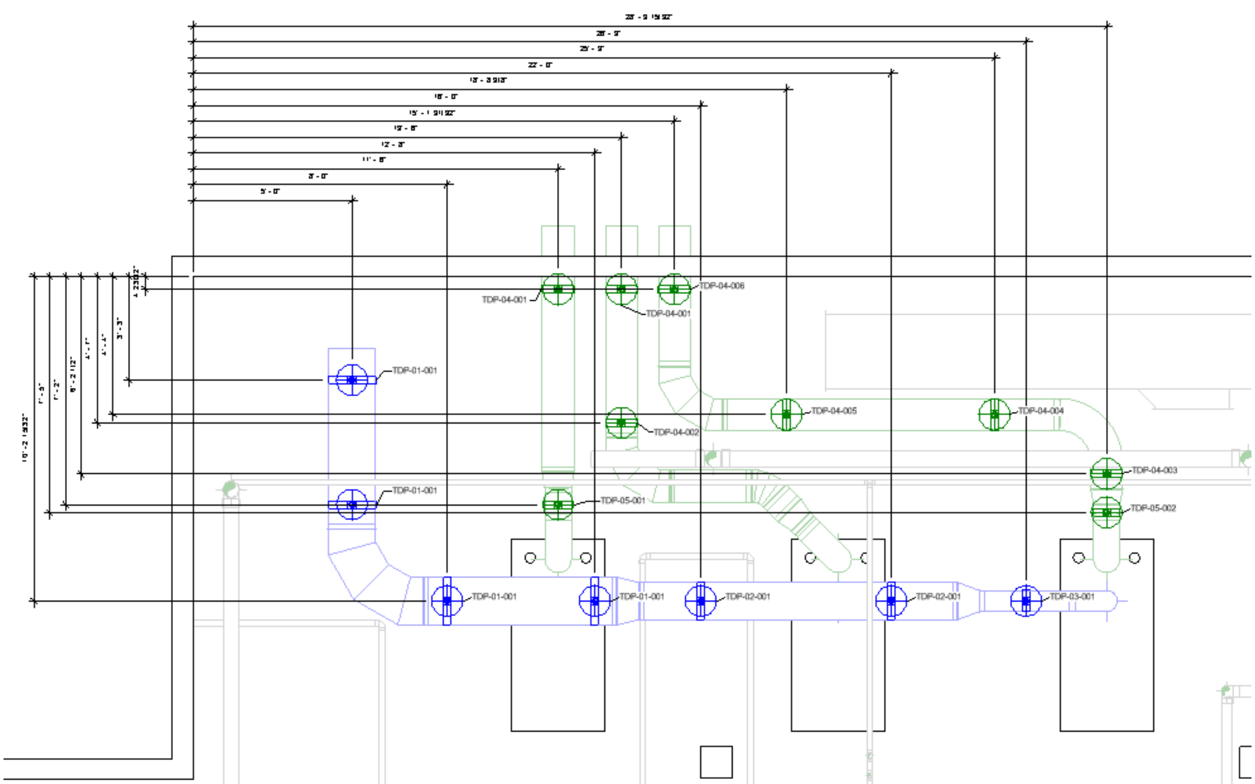

Figure 2: A portion of a more complex duct hanger layout plan.

On the opposite side of the spectrum, we have also begun exporting points for hanger and sleeve locations to be used with a Trimble system. A quick point layout drawing gives a reference for which points are referred to and where they are located in plan. An add-in described later in this presentation makes adding points to your model incredibly quick and easy.

Although these drawings give the whole picture for what should be installed, we have found that also providing a 3D Isometric view of the entire system gives the installers a general picture of where things are routed, why they offset in different places, and how the system should look once installed. We have been told on a couple occasions that this drawing is the most helpful for wrapping their heads around the dictated routing. Given that this is the easiest drawing to produce as it requires no annotation, it was a simple add to our list of drawings.

Finally, we have recently begun producing spool drawings for complex systems that want to be prefabricated. These are produced using assemblies and material takeoffs, but we have found an easier way to produce these using a Victaulic add-in which we will discuss in a later section. Using this add-in, we can quickly produce spooling drawings for entire systems, making prefabrication possible and simple.

Of course, these drawings cannot be useful without a full 3D coordination process. We utilize Navisworks Manage to facilitate this coordination, performing simple clash detection twice a week. More on this subject in a later section. However, it is important to note that we are consistently shooting for a LOD 300 minimum, while incorporating aspects of LOD 400. We have been using the term LOD 350 to essentially describe LOD 300 with hangers and clearance zones added in. The next section describes how we attain LOD 350 using Revit Fabrication Parts.

Revit Implementation

Having started in structural BIM modeling our team was already very familiar with how Revit works in general. Furthermore, the architectural, structural and MEP design models we receive at the start of a project are almost always in Revit. Thus, the natural choice for modeling the MEP systems for coordination is to use the Revit MEP systems. However, Revit MEP systems are still in development, gaining new features with every release. Thus, over time, the methodologies may change what and how we model these systems.

There can be a big difference between how the model will behave and the drawings will look between using Design Parts and Fabrication Parts. The next section looks at these side-by-side.

Design Parts vs Fabrication Parts: Pros and Cons

The design systems in Revit are very useful for sizing the systems initially, getting the basic layout of the pipe runs, and giving a general idea of what should be placed where. However, the pipe and duct produced do not necessarily represent what is going to be built in the field. For example, these design parts do not include flanges for duct, or proper sizes for valves and fittings. These of course can be developed using Revit families, but the native Revit Fabrication Parts can be a great and easy alternative to developing hundreds of families. With this, attaining a higher LOD is much simpler. Modifications to these fabrication parts can be attained with the use of Fabrication CADmep, a topic we will discuss in a later section.

With Fabrication Parts, we can route systems quickly and easily by snapping pieces together like Legos. Furthermore, adding hangers is now possible and very easy (though it has been made even easier by an add-in by DeWALT). However, fabrication parts do have their drawbacks.

One of the main drawbacks to Fabrication Parts is they cannot perform any calculations like the Revit design families can. It is worth noting that design families are built for MEP engineers, whereas fabrication parts are built more for MEP contractors. Furthermore, Revit does not natively have a way to create new custom Fabrication Parts. It must rely on Fabrication CADmep to add any new items to the list.

Thus, it may be useful to start using design parts, then convert to fabrication parts once coordination has started. This allows one to gain the benefits of both types. There is a caveat, though. What is allowable in design parts is not necessarily buildable in the real world. For example, a copper elbow of 80 degrees is possible to implement in design parts, but when trying to convert to a fabrication part, Revit will not have an option available that matches, so it simply won't convert the family to a fabrication part. Furthermore, conversion of valves is a bit tricky, with most valves not having a counterpart. Thus, the conversion process is rarely clean and will require some checking and QC to make sure everything is what it should be.

One can create shared parameters that relay information back to the user for use in tags and annotation. We also utilize Revit Worksets to make our drawings a bit easier to control. The next section will discuss this process.

Achieving the Most from your Model

As stated before, one difficulty of using Fabrication Parts is a lack of useful parameters for tagging. Fabrication Parts are not Revit families, and thus adding parameters is a bit more involved. The easiest way we have found to add parameters to items is to add shared parameters to the project, applying them to the fabrication parts in question. This process is quite simple and will apply to all of your fabrication pipework, duct, or whatever category you choose.

Another example has to do with filters. In the out-of-the-box Mechanical template, there are several filters already created that act upon the Revit families based on system (Domestic, Hydronic, Vent, Mechanical Supply, etc.). These filters filter by the System Classification of the family in question. Thus, these will not work with Fabrication Parts, which do not have a system classification. These filters must be replicated utilizing the very limited parameters natively available for Fabrication Parts, or using shared parameters as described above. However, this requires filling out the comments for every part in the system. This system of filling out parameters for all parts can be incredibly tedious and time consuming.

Thus, one very useful system to set up prior to getting started is a series of worksets representing each system you will have in your model. Using Worksets to mimic System Classification is going to make controlling your drawings easier and faster, being able to set up visibility graphics with certain systems turned on and off, as well as create filters based on workset to get the colors of systems correct for both pipe and insulation.

There are a number of things we should consider and set up first before just dropping pipe and duct into the model. We need to consider how we add content, what we want to add first, and how we want to represent our information.

Setting Up Fabrication Parts

Getting started with Fabrication Parts can be very simple. First, open a new model using the native Mechanical Template. Make sure you have your Fabrication Parts panel open in Revit and open the Options menu in the bottom right corner. Select your preferred Configuration file for the project. There are four to choose from natively in Revit. I like the Revit MEP Imperial Content as a starting point. Then, select your services and transfer them to your project on the right. Press OK and start adding content to your model.

Create Useful Shared Parameters

Now is the time to set up all your shared parameters you would like to use in your project. Some of the parameters we have set up include System Abbreviation, Pressure (for HVAC applications), and Valve and Fitting Shorthand Descriptions. All of these have use in tagging different parts for your drawings. As discussed, one of the challenges with shared parameters is that they must be filled out manually, which can be incredibly time consuming. An add-in for Revit that I will talk about later in this presentation can help with filling out this information. Again, the point is to make it as easy as possible for the field.

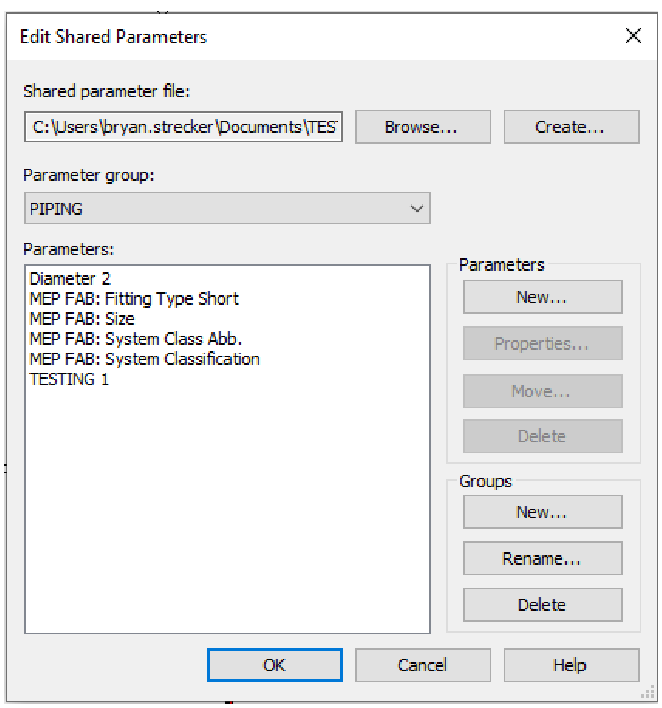

Figure 3: The Shared Parameters Dialogue. Creating useful parameters at the beginning of a project can save time later.

Set Up Worksets

Create a workset for each system class you plan to have in your model. This will drastically help in getting your drawings to look and operate how you wish. Worksets offer a number of benefits that simple parameters do not offer. First, they can be turned on and off at will in visibility graphics. Second, they can be used to create filters that can turn both your pipe and insulation a certain color, give them a different line weight and style, and ultimately give you complete control over your parts' visibility. The main benefit, though, is that you can set your workset and not have to fill out the service for each individual component.

Fabrication CADmep

Fabrication CADmep has been in use for years as a MEP modeling program, and has many uses for creating all of the designs for MEP systems. However, we will not be using this program for its original intended use. We will be using it to make our Fabrication Parts in Revit more powerful, controllable, and useful overall. Although the native Revit Fabrication Parts have just about everything one could need for modeling their entire systems, it does not yet have the ability to add new parts, add new insulation systems, or use many real-world parts that are available off-the-shelf. The Fabrication Parts in Revit are rather generic in nature, following code for sizing fittings and accessories. We want more out of our Revit models, though, so we will have to turn to Fabrication CADmep to accomplish our goals of a LOD 350 design.

The next few sections go over how to use Fabrication CADmep to create insulation specifications for certain systems, as well as to add new Parts to our catalog. These steps are not necessarily difficult to perform, but to a Revit user, these can be completely foreign.

How To: Create Insulation Specs

The native Revit insulation specs for fabrication parts are relatively limited in their nature, only allowing for certain insulation thicknesses and no ability to add new insulation thicknesses like the design parts can. With design parts, one simply adds insulation to a piping or duct system, adjusting the thickness and material as desired. This section will detail how to add a new insulation specification to your fabrication parts catalog. From here, it is a simple selection of the customized system as a parameter to apply the insulation.

The first step is to open Fabrication CADmep, then select which configuration you would like to edit. We will be using the Revit MEP Imperial Content V2.2, available natively in Revit 2019. Next we will edit the global database by clicking the button that looks like a little open book. From here we can edit a number of things in our database, and ultimately our Revit Fabrication Parts configuration. What we are looking for at the moment, though, is to select "Fittings," then select "Insulation Specifications" in the side bar. Here, we can look at the insulation specifications we have available natively, as well as any ones that we have created. Currently the specification selected is called "Acoustic Liner 1"." The easiest way to create a new specification is, as is typical with anything in Revit, to duplicate another specification and modify it to our liking.

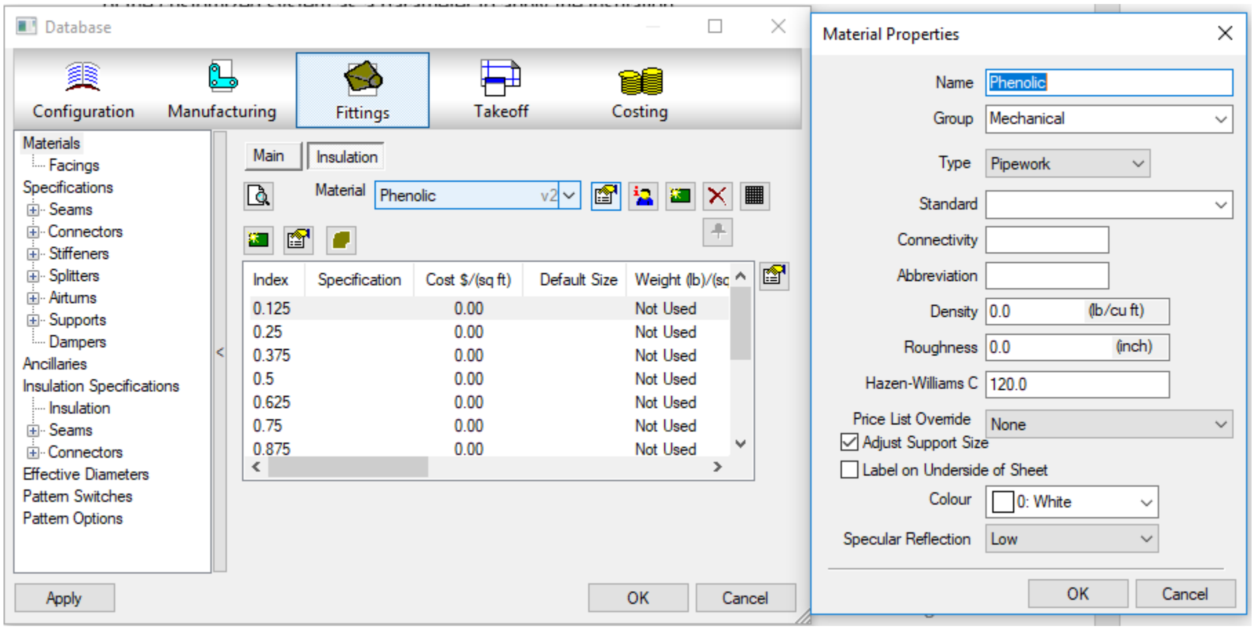

Figure 4: The Fabrication CADmep Insulation Material Properties dialogue where we edit and create new insulation specifications.

Next we will need to select which insulation specification we would like to use as a starting point for our new specification. Here, I have selected the General Insulation under Piping, version 1. This will allow us to create a new piping insulation spec. You can do the same thing for duct, but for this exercise we will stick with pipe. Next, we will select “New” and the program will ask us if we would like to make a copy of the selected insulation specification. Click “Yes” to continue. The next window that pops up will ask you to name the spec. Name the specification something that makes sense for what you will be using this for. For example, “Domestic Cold Water”. We will select the Pipework group if it is not already and give it an abbreviation. Here we can also select where the insulation will be placed, whether it is a wrap on the outside of the pipe or a liner. We will select “Outside” for now. If you would like to alter the connections or seams, this is the place to do so, though we will skip this for now. Once you have your name, group, and location set, click OK. These can always be changed by clicking “Properties” in the Database dialogue.

The next step is to edit our database such that we get the right insulation thickness for different sizes of pipe. This can be as simple or complex as your system requires. For this exercise, I have chosen to make a very simple specification, only giving two different thicknesses of insulation. Double click one of the entries shown to edit it. Note that the way it works is you set what size of pipe, less than or equal to, that we want to edit. For this example, I will set that all pipe 2” and smaller gets ½” insulation, whereas anything larger than that gets 1” of insulation. Make sure the insulation type is correct for what you are using it for. We will select Phenolic ½” and 1”.

Once you have all of your sizes and insulation thicknesses set, simply click OK and your configuration will be saved, ready to use in Revit. A later section will detail how to apply these in your Revit configuration by simply reloading.

How To: Download Parts from the Web

Similar to Revit Families, many manufacturers take the initiative to create fabrication parts and supply them online for anyone to download and use. This section will detail how to download these parts and add them to our usable catalog. Thus, the first step is to download the parts we would like to use. Next, we add them to our service as required. Finally, we save these to our configuration and reload them in Revit.

As stated, the first step is to find new parts you would like to add to our service. One can create custom parts from scratch, but MB BIM has yet to get into this. What we have done thus far is to simply download new parts from manufacturers, or to copy and modify an existing part. Fabrication CADmep has a very powerful command that allows the user to search for parts from manufacturers that have already been created. Engineers are inherently lazy, thus this is our first choice for adding parts to our catalog. This command is simply “DOWNLOADCONTENT”.

In Fabrication CADmep, type in the command and hit enter. The dialogue that appears will prompt you to search for just about anything we could want. We will start by adding a couple fittings to our piping specs. You can filter based on a number of parameters, including metric vs imperial, manufacturer, templates, and OEM products and services. We will select our manufacturer and select Imperial for our units. You can also add keywords or a description to further filter this list down as it can be quite daunting at first. We will add the word “Copper” to our keywords so we can find all the copper fittings available. Then click Search and the program will do a search for everything that fits this category. Note that different materials surface for us to choose from. We want Mueller fittings, so we will click the green plus sign to add these to our download list. Once we select all of the components we would like to download, we simply click “Download” in the bottom right corner. A dialogue will pop up showing which objects have been installed and updated. Click OK. You now have a new service under the dropdown that has all of these fittings available for use in Fabrication CADmep. The next steps involve bringing these new fittings into our other services, then into Revit for use with our Fabrication Parts. This next section details how to bring these in, as well as to modify these so they connect properly with the rest of our parts.

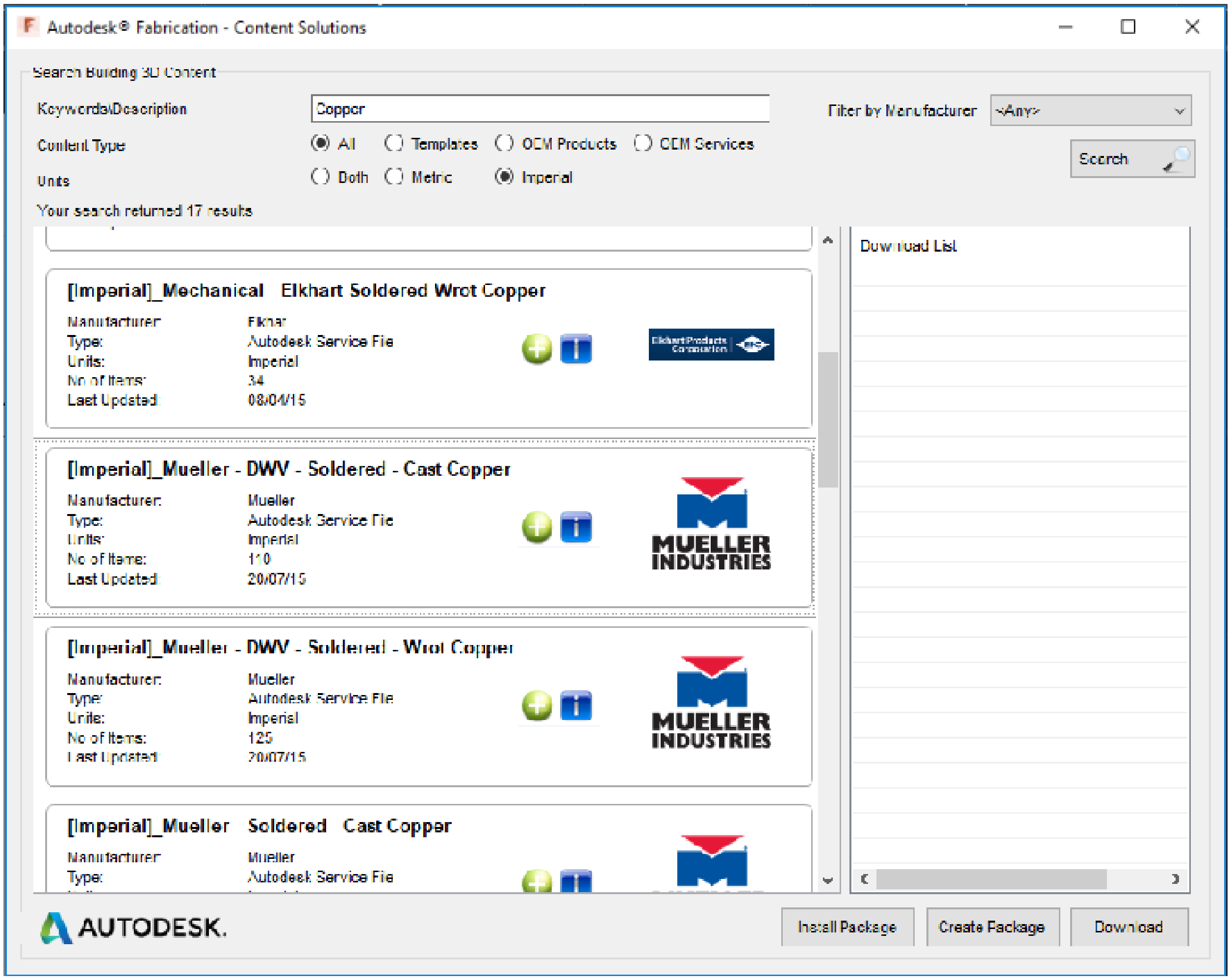

Figure 5: The DOWNLOADCONTENT dialogue box.

Applying your new Parts in Revit

The first step in bringing these new valves into Revit is to add them to a specific service we will be using in Revit. At the top of your screen, click the service dropdown and select the service you would like to add the valves to. For our example, we will select “Copper Soldered”. Next, we click Edit Service Database, and another dialogue pops up to have us select what service we would like to edit. Since we already selected Copper Soldered, this is selected in the dropdown. If you need to edit multiple services, you can easily switch between them here. We will next select “Service Information” to edit the service. Another dialogue pops up. At the top, we can edit the name of the service, and select which group it will show up under. On the left, we have the option to select where to pull the parts from, and on the right we have our full list of fittings, valves, etc, that we would have available in Copper Soldered. On the left, select “Other Templates” to find the Mueller template we just downloaded. We select Soldered, and all of our new fitting buttons appear. From here, it is a simple drag and drop to add these new fittings to our current service.

Once you have added the components to your service, we simply click OK, and Fabrication CADmep saves our configuration. From here, there are a number of steps to bring these items into Revit. First, we must make sure the fittings are going to connect properly with the rest of our service, as the connector is not necessarily the same type we want.

On the left, you will see your parts, including your newly downloaded cap. We want to edit the connector so it works with the rest of the fabrication parts in this service, so we right-click and select Edit, then the part. A dialogue pops up that will allow you to edit several parameters, including the size and connectors which are what we are looking for here. The view of the part will show you in detail what each abbreviated part is called. We want to edit C1 connector. We click “Other” and on the right we have the connector type. Click the dropdown and look for “Copper Soldered Cup” as this most closely resembles what we are using in this service. Note that this will change the connector for all sizes, so we do not have to worry about changing this for every size we want available.

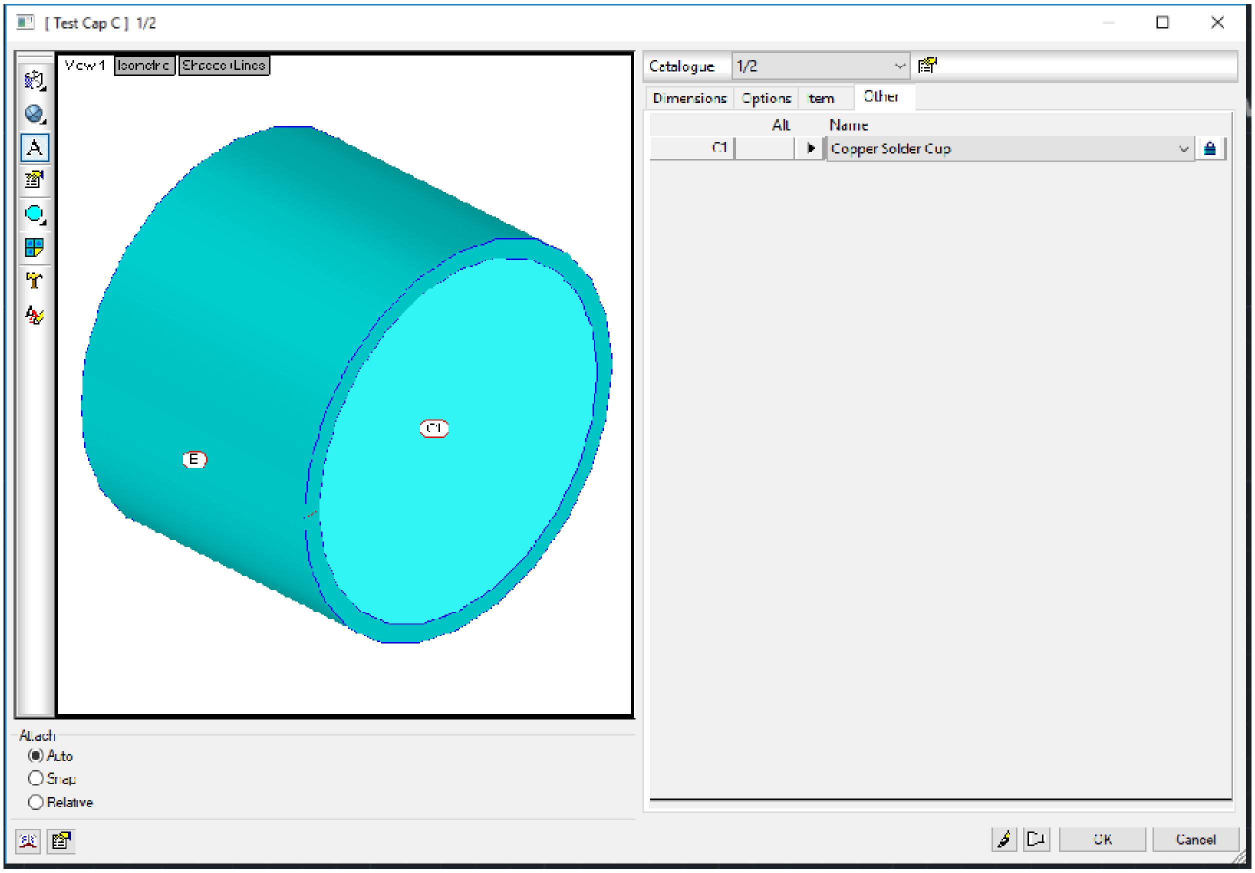

Figure 6: The Edit Part dialogue box in Fabrication CADmep where we will edit the connectors.

Here is also where we can edit the dimensions of the component to more closely resemble something in the real world. To do this, click the Edit Product List button. A spreadsheet dialogue pops up wherein we can change the dimensions for the part. Note that here we can also add a new size to our list of available sizes. For more complex components, this list is much more involved. For now, we'll leave this as is.

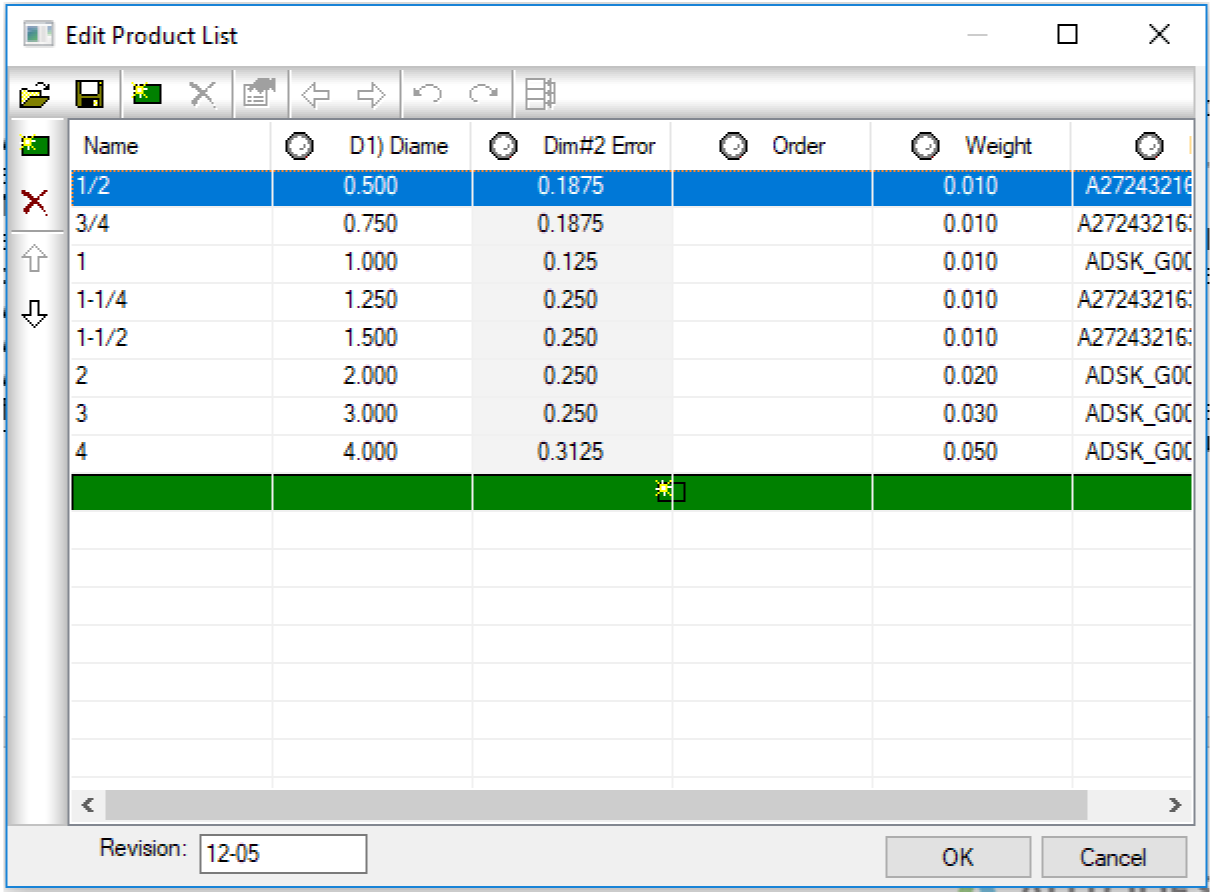

Figure 7: The Edit Product List dialogue box in Fabrication CADmep where we will edit the fitting dimensions.

Once your component is edited per your specifications, we now want to make sure we can add these to our systems in Revit. Now we go back to Revit. In the bottom of our Fabrication Parts panel, click “Settings…”. In the dialogue that pops up, make sure your configuration is the correct one, then click “Reload Configuration.” From here, select which services you would like to use in your project and move them over to the Loaded Services list. You now have a new component added to your service!

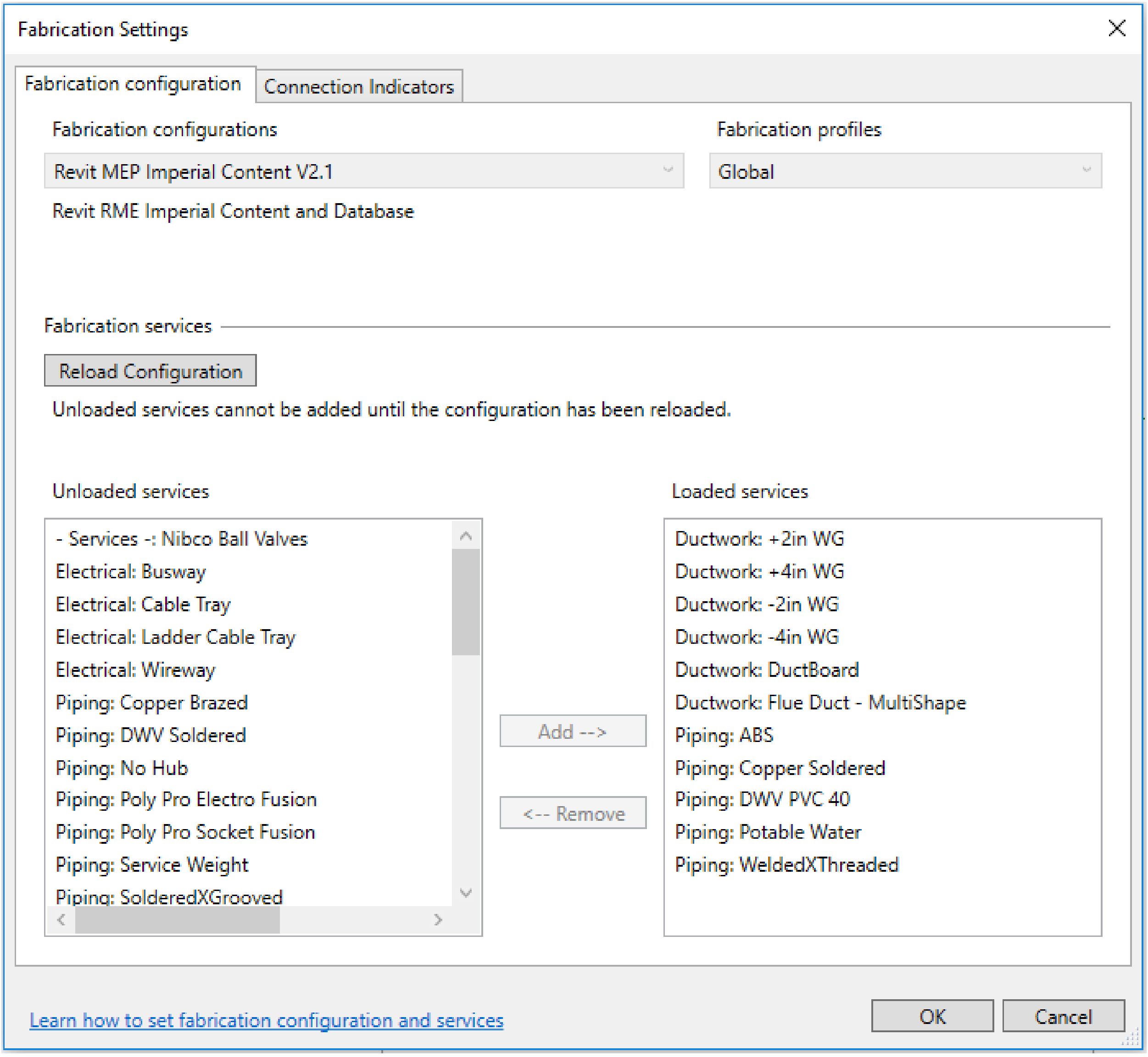

Figure 8: The Fabrication Settings dialogue box in Revit where we select our usable fabrication services.

Revit Add-Ins: Your Best Friend

Throughout this presentation I have mentioned a few add-ins for Revit that drastically speed up the modeling and coordination process. These include DeWALT's Hangerworks, Spreadsheet Link, and Victaulic's Pipe Tools. Each of these is relatively inexpensive and easy to use.

The next few sections will go into detail about how the add-ins work, as well as how to utilize them to our benefit. DeWALT Hangerworks' main function is to add hangers to your model systematically and according to rules the user will set. Victaulic's Pipe Tools has a number of functions that are incredibly useful, but the main function we will be discussing is how to quickly and easily create spooling drawings.

DeWALT Hangerworks

DeWALT's Hangerworks is an add-in for Revit that mainly is used to add hangers to piping and duct systems. The main benefit over the typical Revit Fabrication Parts hangers is that one can set up a list of rules for the placement of hangers, then add the hangers for an entire system in one click. This drastically reduces the amount of time required to add hangers because these rules can be exported/imported into a new project and used once again.

Once installed and licensed, Hangerworks adds a new ribbon to your access panel simply named DEWALT. The first button in this ribbon is your settings. When opened, you are greeted with the ability to Export, Import, or Reset your settings for the project. The next tab is used to calculate seismic reaction forces for systems. To be quite honest, MB BIM has not gotten into these seismic calculations or their application as we do most of our work in Colorado, and there's not too much seismic activity in the Denver area, so we'll move on to the next tab.

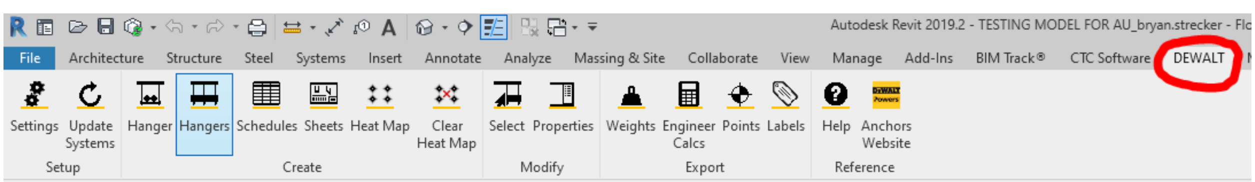

Figure 9: The DeWALT Hangerworks tab with all of its tools.

The Project tab sets up the different level elevations, slab thicknesses, deck offset, concrete properties, and deck profile (whether wood formed or a steel deck), among a few other things. This will help place the anchors for your hangers at the correct elevation based on the level the piping is hanging from. The Placement tab allows you to set the piping span, proximity between pipes to be set on the same trapeze hanger, trapeze sizing rules, rod extension, point visibility (which we will get into in a moment), and structural framing detection. Unfortunately, the hangers will not detect a slab, but only structural framing. This can be a bit of an issue when trying to attach hangers to a sloped slab due to drainage or perhaps in a parking garage. However, these hangers can be quickly adjusted at each hanger rod, so the tool still saves a bit of time by adding your hangers in automatically.

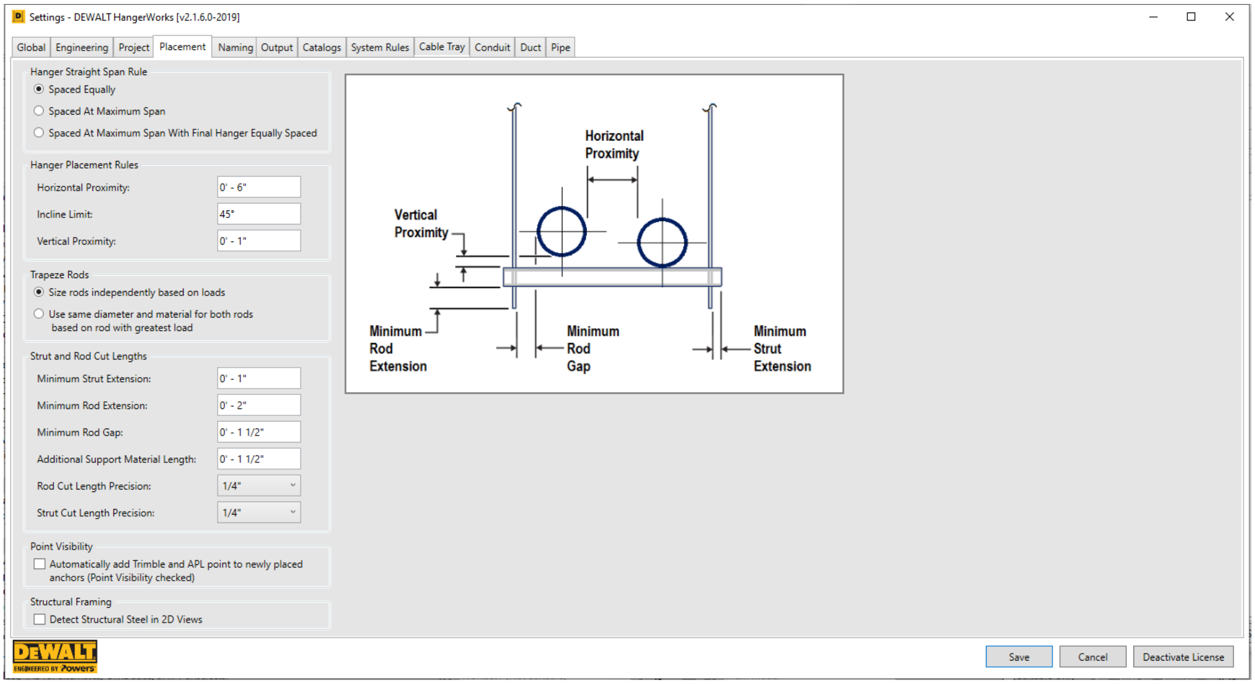

Figure 10: The Placement tab for setting up trapeze hanger settings.

The next tab dictates how hangers are named, giving them a user-set prefix, a numbering system, and a unique hanger mark. This will be important when scheduling your hangers once they are added to the project.

The Output tab dictates how the hanger drawings will look, including titleblock, label placement and color, and various view placement. This can be very helpful when producing hanger drawings for fabrication purposes. Again, this is an area that MB BIM has yet to get into in much detail, but we are beginning the process of learning how to utilize these drawings to the benefit of the field.

The Catalogs tab allows you to specify which brands of hangers are going to be used on the project. Obviously this tool was created in an effort to get people to use the DeWALT hanger catalog, but they also have a number of other hangers, including generic hangers that do not necessarily belong to a specific manufacturer. For our purposes, we have been mainly using whatever the program would like to place, often DeWALT hangers, as the specific brand of hanger isn't necessarily important to us, only what type of hanger is used. The specific hangers can then be chosen by the field and adjusted per their requirements.

The next tab is the System Rules tab, which allows you to set rules for what types of hangers are used for which systems. For example, if you would like to use only clevis hangers for your domestic cold water pipe, you can set this here. We most often use this when we know we are going to use only trapeze hangers on a particular system. This allows you to set that for all of our copper piping, for example, we will use clevis hangers, or to force trapeze hangers to be utilized. This can be helpful if you know exactly what the field intends to use for a particular system. Otherwise, these rules can be left blank, allowing the add-in to choose what hangers are utilized and where.

The final four tabs allow you to set spacing rules for your different systems based on the families you are using in your project. Specific settings include proximity to each other on straight runs, and proximity to different fittings (which you map in the “System Mappings” dialogue at the top).

Once all of these properties are set up, it is a simple click of the “Hangers” button to add hangers to an entire selected system. The add-in will place hangers according to your rules, filling out all of the required parameters in order to create a material takeoff for your hangers. One click and you have all of your hangers added and ready to be scheduled.

Another benefit of Hangerworks is that it can automatically add points to be used with a Trimble or GTP system in order to seamlessly export hanger locations from your model. The tool adds one of each of the points to the anchor of the hanger, allowing you to get the location with respect to grid and the elevation of where the hanger should be located. From here, the hangers included in Hangerworks automatically give rod length and diameter, and can be read from a schedule which is created automatically using the “Schedule” button.

The add-in has a number of other tools that can be used, including the ability to create labels for the field, create assembly drawings for your hangers, and export the points that have been added, or even create a heat map that shows the reaction forces on the framing the hangers are attached to. These can all be useful to ensure the placement and use of hangers is correct in a quick and easy way.

Victaulic Tools for Revit

Victaulic Tools for Revit is an add-in, created by Victaulic, that allows you to do many very useful things. The main focus of our efforts is the ability to create assemblies and views, creating spooling drawings that the field can use to prefabricate entire systems prior to installation. However, there are a number of pipe tools that I have found to be very useful.

The first pipe tool is the ability to tag fabrication parts on the fly. This also has the added benefit of giving each piece of pipe or fitting a specific mark used for scheduling and tagging in assembly views. Simply set the type of tag, the prefix, the starting number, and format for the mark. The program automatically applies this mark to the “Vic_Mark” parameter, though one can choose another shared parameter to apply the mark to. This tool also adds tags to your view. The “Splitting Tool” here also allows you to split straight pipe runs into equal segments based on parameters, adding couplings where necessary.

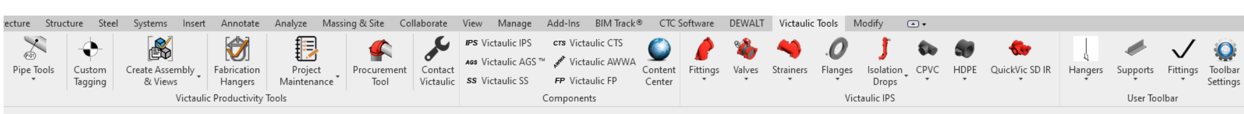

Figure 11: The expansive Victaulic Pipe Tools Ribbon.

The next tool allows you to select pipe and rotate the entire assembly around one pipe. Normally one can only rotate a fitting if there is nothing attached to it, but with this tool, you simply select the pipe you would like to rotate (including the pipe axis you want to rotate around), start the tool, select the axis you want to rotate around, and rotate a specified number of degrees around that axis.

The next tool we have allows you to resize a system. Normally one can only resize fabrication parts if it is not connected to anything else, disconnecting the item from the rest of the system. This resize tool allows you to keep your system connected and working properly.

Another tool we have played around with is the Fabrication Hangers tool. Essentially this allows you to add hangers to a pipe quickly and easily based on rudimentary spacing rules set when the command is prompted. However, this tool is not as controlled as the DeWALT Hangerworks add-in and cannot add hangers to an entire system in one click (one must click each pipe individually), thus it is not quite as fast or efficient as Hangerworks.

If piping with Victaulic fittings, this tool is irreplaceable. It automatically gives an entire catalog of Victaulic fittings and couplings that can be used on the fly. However, these are not Fabrication Parts, and thus we haven't explored this fully. We would like to explore this further in the future once we get into modeling Fire Protection.

Above all of these, the tool we use most commonly is the "Create Assembly & Views" function. If we click on the Assemblies dropdown on the Victaulic Tools ribbon, then select Settings, we get a dialogue that allows us to choose views we would like to create based on view templates we have set up. We select first which views we want to include in our sheet, then select the view template from our list of templates created in this project. If we click the ellipses, we can choose what type of viewport we want to create based on what is available in our project. We can give these views a specific name and set the orientation for tagging. The tags added will be based on the "Vic_Mark" parameter, so we must make sure these shared parameters are loaded into our project.

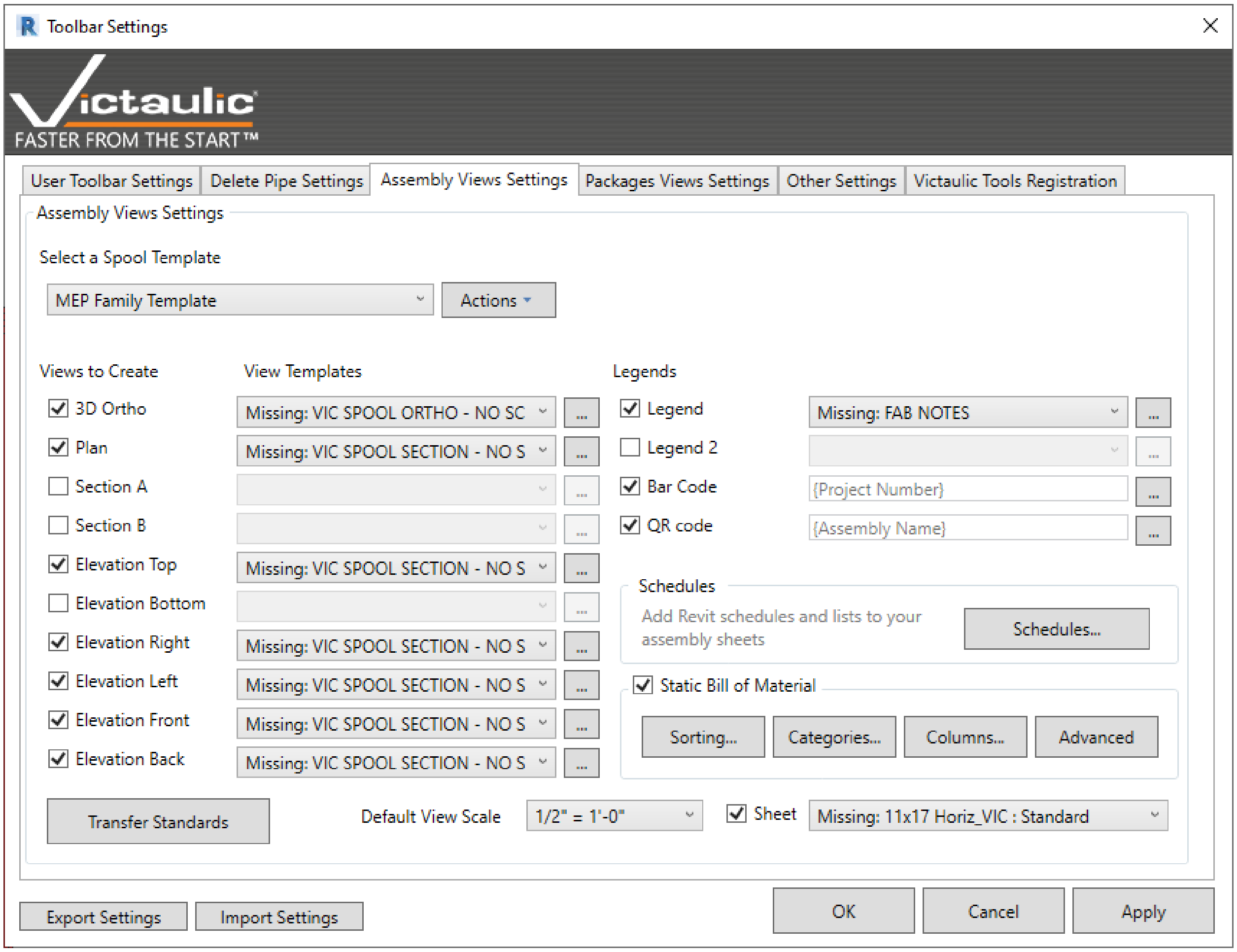

Figure 12: The Victaulic Toolbar Settings dialogue where we dictate views, schedules, and legends for our spool drawings.

Next, we set up our schedules in a very similar manner, choosing the number of schedules and their templates we would like to be created on the sheet. We can also add a couple of legends that may help explain the views and schedules. Next, we can create a static Bill of Materials, specifying the categories of parts to be listed, the columns we would like to include, as well as the sorting of these in the list. Finally, we set the title block. Once our settings for the project are created, we can export and save these for a later date. Likewise, we can import these settings from previous projects, we simply need to ensure the templates we have chosen are common among the different projects.

Now that we have the settings ready to go, we next select which pipes we want to put into any given assembly, then click the “Create Assembly & Views” button. A dialogue will pop up allowing us to give the assembly a prefix and number, choosing which template we would like to use. We hit OK and our sheet is automatically created with all of our views and schedules. We simply move these into place and we are good to go.

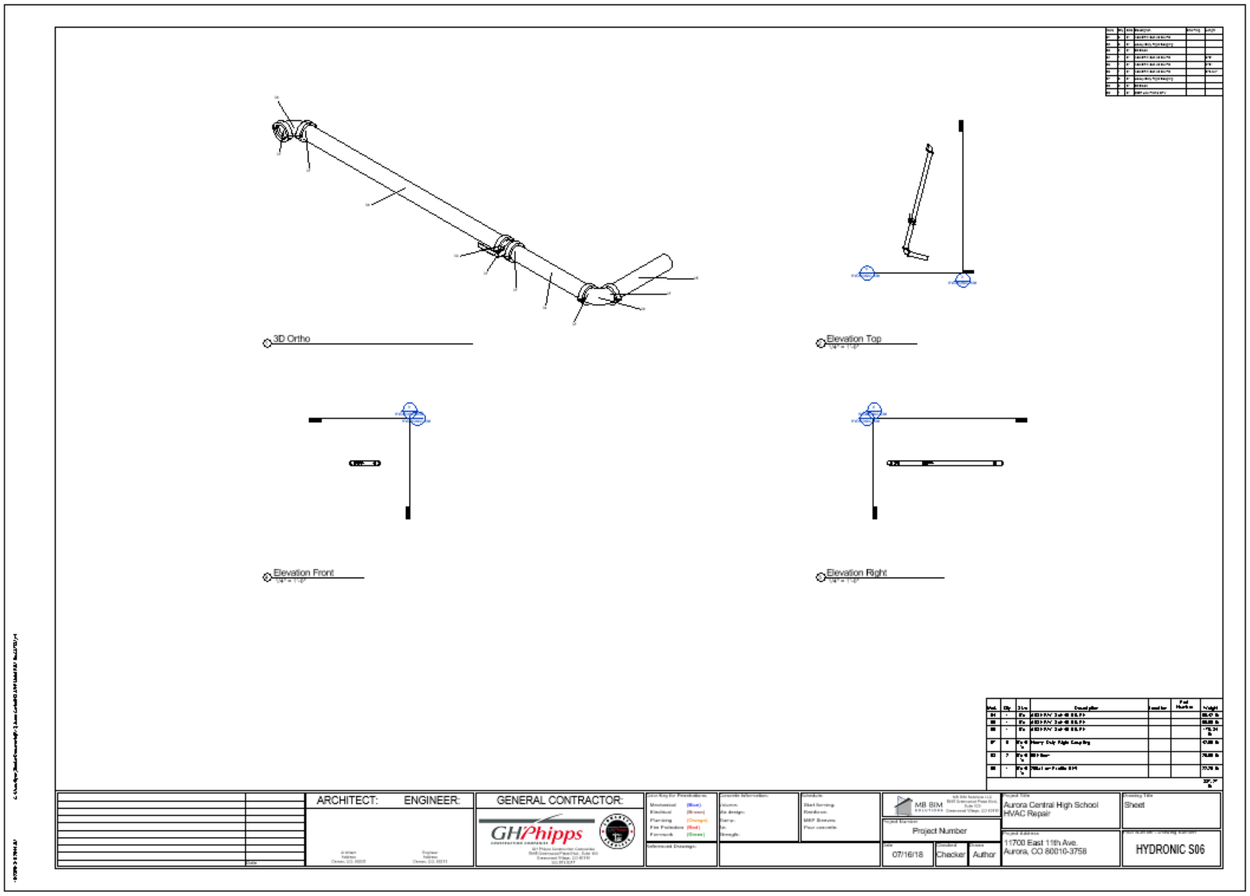

Figure 13: A simple example of a spool drawing created by Victaulic Pipe Tools.

Spreadsheet Link

Spreadsheet Link is a tool by CTC Software available in their BIM Project Suite. It in the simplest terms is Excel brought into Revit. You can create schedules similar to those in native Revit, but with a much broader spectrum of available model categories and parameters, including many of those not normally available. These schedules can be used to quickly fill out parameters for hundreds of parts and pieces at once. These parameter changes are then applied to the project. Following is an example of how to set up a valuable schedule for MEP Fabrication Parts.

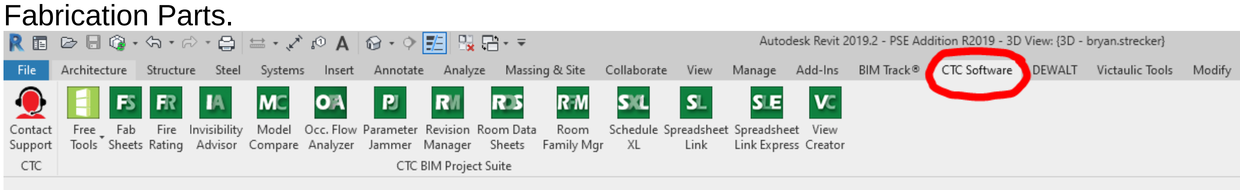

Figure 14: The CTC Software tab, containing Spreadsheet Link.

First, the application is started by going to the CTC Ribbon tab and clicking on the Spreadsheet Link button. A dialogue opens presenting you with a list of model components and types. Select MEP Fabrication Pipework and click the arrow to bring the selection to the right, creating your spreadsheet. From here, a list appears giving all of the available parameters for our piping Fabrication Parts. First find Workset at the bottom of the list. We will use this to sort by, making it easier to apply useful information to our new shared parameters. Next, we will select size, comments, and any other identifying data we may need to fill out our shared parameters. Switch over to the spreadsheet view, and begin filling out the cells just like you would in Excel. In fact, these spreadsheets can be easily exported to Excel, modified, and imported back into Spreadsheet Link. Once all your changes are made, you simply click “Apply” and all of your parameters are filled out for you. The uses for Spreadsheet link do not just apply towards MEP systems. It has many uses for any industry, as we use it for all of our Structural applications at MB BIM as well.

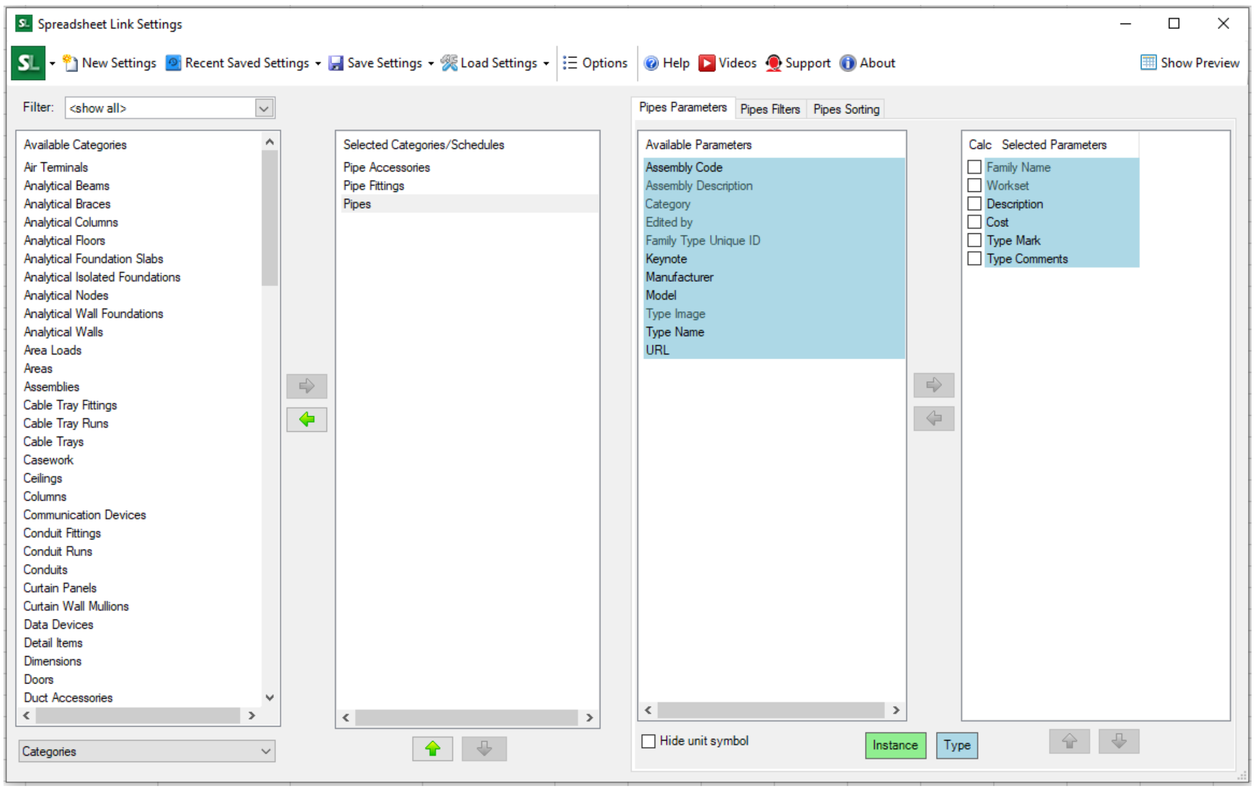

Figure 15: The Spreadsheet Link Settings dialogue where we set categories and parameters.