JOSH ASCHE: All right, we can we can go ahead and get started. This class is Fabrication Parts in Revit, Quickly and Easily Go From Design to Fabrication to Fabrication ESTmep and Beyond. So we're going to show, basically, a full 360-degree circle of the software going from Revit to estimating to CADmep to CAMduct.

Just a show of hands, who has done anything with fab parts and Revit up to this point so far? So pretty good amount, OK. When I was putting this class together, brainstorming and doing this, I thought it would be a good idea to take this and show the process of going from Revit and making the round trip as I just described.

But as I got digging in here, I realized it was pretty ambiguous to try to do all this in a one-hour time frame and really dig in deep. So it is more of an overview of things. There's some key concepts and principles I want to get across. So as we're going through this, if you questions or want anything else clarified or further explained, by all means, stop me. And then we also should hopefully have some time at the end of this for some Q&A.

So here's the summary. But, again, more or less, we're going to start in Revit, take it through the fabrication process, fabrication line of products, starting to estimate, coordinate, and then, ultimately, fabricate. I do see a lot of familiar faces out there. But for those who don't know me, I'm Josh Asche.

I work with Comfort Systems USA, work with two other guys, and we pretty much head up the fabrication database side of things for all of Comfort Systems. So we have one database that all of our operating companies are running off of and using roughly 24 companies and about 180 users, all utilizing the same database. This is Bryan Miller.

BRYAN MILLER: I'm with Environmental Air Systems. We're one of the operating companies under Comfort Air Systems.

JOSH ASCHE: So I've been pretty much in the fabrication world of things as far as EST, CAM, and CADmep goes. Bryan has been on the Revit side of things pretty much his entire career in this. So I'm just getting get my feet wet with Revit, with the new areas we can use of fabrication. So I'm taking the fabrication side of things and Bryan's here to hammer down on the Revit stuff.

Our key learning objectives here is we're going to review the workflow. And just, again, to

scratch on, it we could have probably spent the whole hour doing this, but just kind of scratch the surface and give everybody an idea as to how to go through this process inside of Revit, converting the fabrication or the design parts to fabrication parts. Then we're going to take those parts that we've converted and we're going to export out a fabrication file or an MAJ file that can be opened up across EST, CAD, or Camduct.

Once the file's out, we're going to start in estimating. We're not going to dig in real deep in estimating, but there were some new features that were added in the 2017 release that I wanted to touch on and get across to everybody. I'm not sure if everybody knows about those or not. And then ultimately take the file over CADmep and do some stuff with it there, compare it to our original file, and then dump out an MAJ to go over to CAMduct.

Just another show of hands. Is anybody doing anything with ESTmep as far as getting hours and pricing and labor for spools or front end estimating? So a few of you. OK, good. All right, so some of you may know about some of these features, some of you may not.

So what we have here-- I'm not going to read all these slides step-by-step. Just going to give you the synopsis here. But the idea here is to first go ahead and get a Revit file from the architects or engineers or building owners that you're working with.

From my experiences, it seems to be pretty hit or miss if you can even get a hold of that Revit file these days. Seems like if you can get a hold of it, the quality of the file's really going to vary quite a bit as well as if the architects or engineers or building owners want to give that Revit file up. I've ran into a lot of situations where they don't even want to give the file up or they want to charge you for it to be able to use it.

But first and foremost, you need to get a hold of the Revit file and see what's in there and what quality of file you're working with. And once you have that file, then, again, decide in the file what parts and pieces you're concerned with. Are you just concerned with the duct work? Are you concerned with just the piping components, the plumbing components, or all of it?

Identify those systems and also use your filters to isolate the systems that you're after. Once you've determined what those systems are and what you're after, there's a button in here inside of it now, it's there by default. And it's a Design to Fabrication button inside of Revit.

And so the idea here is to take design or generic Revit parts and pieces, families, and convert them over to fabrication parts and pieces, OK? So we're going from design to fabrication.

Again, I'm making of a lot of assumptions here when I get into this. I'm not really going to get into how to load your configuration inside of Revit and the whole design line setup of your services to get this all to work inside of here.

Again, a lot of information to cover here. So I'm just making some assumptions that you understand how to get your configuration into Revit and that, again, your services are set up for design line in order to get this functionality to work.

Because if you services are not set up for design line, your design to fabrication, you're results that you get are not going to be what you desire and you're looking for right there. So your services need to be set up correctly and working for a design line. The other portion of this goes back to what I was just talking about here a few seconds ago, and that's the quality of the file.

Even if all your services are set up perfectly and fill in the design line just beautifully in EST or in CAD, if the file that you're trying to convert over from design to fabrication is not drawn all that well or there's a lot of holes and voids or looks great from a planned view but once you go into an isometric view and there's taps not cut in the ductwork or just stuff not tied in and connected together, when we go through this conversion process, again, no matter how good your services are set up, it's not going to convert over all that well because it's just taking what is there and trying to use it to convert over, OK?

So, again, even if everything's set up beautifully, there's still a lot of variables here. But you go ahead and you can select your system. And I recommend doing this in smaller pieces. And when you go ahead and click on the design to fabrication button, it's going to go ahead and pop up a dialog box showing the services that you currently have loaded into your configuration inside of Revit.

So, again, we're utilizing what we have inside of fabrication, the services that are inside of there, piping, plumbing, sheet metal, electrical. And it's going to pop those up based on the system you've selected back here. And essentially it's going to ask you which one of these services that you have loaded up inside of Revit would you like to convert the Revit parts and pieces from over to your fabrication service. So you essentially select one of your services inside of here and then the conversion's going to go ahead and take place.

You can see here's a screen shot after the conversion has been made. You'll notice the service that I had selected here, it's still highlighted. And you can see now from the previous

slide, the connector's probably a little tough to see. But the connector's are more pronounced and we're going to a much higher level of detail when we've gone from the design parts and pieces over to the fabrication parts and pieces.

So you can see here, like on this transition, we now have some connectors on there based off of whatever the pressure class of that ductwork was pointing to. The same thing would hold true on the piping side of things based off of the piping specs that we're using there. But you click on the button, just to reiterate here, the Design to Fabrication button, with the service selected or the system selected and it converts these items over to the fabrication parts and pieces.

In the previous image, you'll notice my ductwork grade here. I have one big, long run of duct work. Or the same thing would hold true on the piping or plumbing side. Depending on if it was copper or steel, it wouldn't matter. You'd have big, long runs of pipe and/or ductwork.

So when you first go through the design to fabrication process, the fittings get converted over and the straight ductwork does as well and now knows which pressure classes it's pointing to. But it does not break the ductwork, piping, or plumbing into the straits and to the specific lengths that we're after.

There's also a button up on the ribbon then that we use to go ahead and take care of this. And that's called the Optimize Lengths button. So if, again, you're not familiar with this, there's a button that will pop up on the ribbon once you have your system selected or keep it selected when you're going through this process. And you can go ahead and click on this Optimize Length's button.

And then that's going to go through and look at your parameters for your ductwork, your piping, and your plumbing. And it's going to change the straight joints over to match whatever it is. So if it's TDC ductwork, it's going to be 56 and a quarter. If it's [INAUDIBLE] ductwork, it's going to be 59 inches. If it's duct made, it's going to be 60 inches.

If its steel pipe or copper, et cetera, it's going to break those out into the lengths that the specs are telling it that it needs to point to and use. So the optimize lengths is going to go through and clean all that up for you, again, based on the systems that you have selected inside of here.

The next thing that came out with the 2017.1 release-- and that just came out here not too

long ago-- is the ability to be able to fine-tune our services that we're using inside of Revit, our fabrication services that we're using inside of here, to dictate and decide how we want these items to exactly to be converted over from design parts to fabrication parts. Again, this is going based off your design line set up and your priorities with your button mappings and how the stuff is all laid out.

And in the previous slide-- whoops, wrong way there-- you'll notice I had radius elbows, long radius elbows, when it was first converted over. And that's because of my button mappings. In the way that my service is set up right here, I have my first priority as a long radius elbow, OK? So, therefore, it defaulted to a long radius elbow.

My next option is a short radius elbow for the way my particular services are set up. And then, lastly, I have the rectangular square elbow right here as my third option. So, by default, even if you don't use this Exclude button, which I'm going to keep talking about here for a second, it's going to default to the way your services are set up inside of fabrication and it's going to run right through your button list and your priorities and it's going to try to fill all these fittings and/or convert them over from design parts to fabrication.

So, with that 2017.1 update that I was talking about, there's now a button down here in the bottom left hand corner. And, again, this will be available on all your fabrication services, not just sheet metal or just piping. It's there for all of them. But you can now exclude items from fill.

So just like in fabrication, for those of you who are familiar with it, you can right click on a button and put the little E on there and exclude that from filling in or basically force a design line to skip that one when it's trying to fill stuff in. That's essentially exactly what we're doing right here. So you go through your service and you can basically force the design parts.

I'm going to get it converted over to fabrication to go to the certain fittings that you're using inside of your service. So if you have concentric reducers or eccentric reducers in your service or, in this case, long radius elbows versus square radius elbows, you can set that up ahead of time. And I have it underlined here, but you want to do this before you fill it In.

Because once you fill it in, it's converted. It's done. The only way to really undo it is to use the Undo button. It's not like we can erase and fill in 3D like we can inside of fabrication. So you want to set this up ahead of time before you fill it in and then it's going to file your design line button priorities to try to fill those parts in from design to fabrication. Yep?

AUDIENCE: So will that recognize a [INAUDIBLE] group from fill-in application when you recognize it's not going to carry over ?

JOSH ASCHE: No, you still have to physically load those up right there. So, yeah, it brings them over, all the services over, but it does not recognize that kind of stuff there.

AUDIENCE: What if I wanted one radius and one square?

JOSH ASCHE: It's a good question. I figured that question would come up. So, at this point, you basically have to erase the-- say, this one, you wanted to have the radius elbow here. You'd have to erase that one and then manually go select your fitting that you want to use and move it and manually go place that one in there. Similar to the functionality that you're familiar with in design line where you can again, force it to use a certain fitting on a node, override the node. Same sort of concept right here.

AUDIENCE: There's no swapping?

JOSH ASCHE: No, not yet there's not. Again, this has made leaps and bounds-- I'm not going to get on a big speech here-- from '16 to '17. There's still a ton a ton of work to do. It's a long ways from where it was.

And with the 2018 release coming out, there's going to be additional leaps and bounds. But there's still plenty to be desired here for utilizing the fab parts inside of Revit. But, again, it's quite a bit further than it was from the '16 release.

This is another thing I wanted to bring up. A lot of people may not-- maybe they are familiar with this. I'm assuming they have not or have not seen this.

Let's just back up. Before the 2017.1 release came out, if you had any in-line items in your piping, plumbing, or sheet metal that you were converting over, the in-line items would just disappear. They'd be gone, OK?

So the software would have no idea what to put there in that place to fill the valves or the strainers or the other items that may be in line. They would just disappear, OK? And then you'd have to manually go back and fill all these items in yourself, trying to figure out what was supposed to go there.

Once the 2017.1 release came out in the programming or coding that was added, the items

now at least stay there in line and do not just disappear. So you can see whatever was intended to go in that particular space. This holds true not only on the piping side of things but also the sheet metal side of things.

So here's just a volume damper. Here's just a fire damper, another fire damper, a round damper, fire smoke damper. Any accessories, it doesn't matter. Anything that's in line.

Again, before the release, it would be gone when you converted it from design to fabrication. After the release, it stays put until you get ready to do what I show you here next. The items are not going to get converted over. They're going to stay as is and they're going to be the generic Revit parts and pieces. And that could get converted over to your fabrication stuff.

What you can do-- and I realize this isn't a perfect workflow either, but it is a way to take care of this-- is, inside of Revit, you basically can go ahead and build yourself a schedule that identifies simply just family and type. So we're trying to identify family and type for those accessories or those in-line items. We open the file, open Revit. If we don't have a schedule built, we build a schedule and we populate that schedule and identify our in-line accessories on our piping, plumbing, and sheet metal items.

What we then can go ahead and do, so we don't get a whole-- if there's 10 six-inch valves, let's say, when we're building our schedule, we can click on the Itemize Every Instance on the sorting and grouping tab. So we can basically just condense that down and make that schedule as small as possible to simply identify what we're after is the family name inside of Revit, OK? So what we're basically trying to extract out of Revit through that schedule is the name of the family of those in-line items.

And we have to identify that first and upfront in order to get this process to work. What we can then do, once we have that schedule built and we've identified these items, is we can export right directly that schedule out of Revit and take it out as a text file and open it up with Excel, OK? So right through the built-in functionality of Revit, we can export the schedule out and open it up with Excel and modify it.

And the reason we're modifying it is we are going to clean up characters inside the family naming convention as to whatever families we use for those particular in-line items. You can go ahead and replace the periods and the spaces with an underscore to clean that up like we did down here, the colon that we have here. This right here-- and I'll show you this here in just a minute-- becomes your button mapping inside of fabrication to go ahead and get these items

to convert over, OK?

So you first have to get the file open, build your schedule, identify these items, get it out into Excel, and we can start to clean it up. What happens then is, back inside of fabrication-- so now we're back out of Revit and we're over in the fabrication world or side of things-- we have to add in these button mappings into our services that we're trying to use over inside of Revit.

We have to add these button mappings into fabrication to get those items to now convert over from design parts to fabrication parts using the appropriate button codes for those particular valves, strainers, fire dampers, whatever the situation may be.

So I just have a little spacer sorting thing here called Revit mappings. It's a way we started going about trying to do this to try to organize this from all of our other previous button codes and button mappings that we have inside of here. But basically you're going to go through and you're going to identify this.

And this list may be four deep like it is here or it may be 12, 20 deep, depending on all the different parts and pieces and families that were used inside of fabrication. Again, we're working with the model that we were provided. We don't really have a lot of control over that. Yes, sir?

AUDIENCE: Couldn't you just change that to to SLV in Revit?

JOSH ASCHE: Change what to SLV?

AUDIENCE: The code in Revit.

JOSH ASCHE: Well, this is the only way from all the testing and stuff we've done. This is the only way we've been able to get those to fill. So I don't think that functionality is quite there yet just to make the swap directly inside of Revit.

So, again, you can see some of these families that were used inside of Revit have some variables in there. Like this one's two through six inch and then it's a two-inch one. This one's two through 12, and it's a six-inch one. You may have, depending on the family that was used, you may have a different family for every single size that's in there.

So again, there's a lot of variables here to get this process to work and follow through. But at the end of the day, whatever it is your schedule pulls out of there, those mappings have to be

added inside of fabrication and then given the appropriate button code for the item you want to use in its place. Same thing holds true, exact same thing, on the sheet metal side of things.

So, again, we're just identifying those families that we've cleaned up inside of Revit, or inside of Excel, rather. And we're adding those in and we're giving it the appropriate button code of the fabrication item we want it to use inside of fabrication that we wanted to replace the generic Revit item here.

So just to recap all this, we open the file up in Revit. We get our schedule. We get our schedule exported out to Excel. We clean up the naming conventions of the parts and pieces that were used inside of there. We then bring those back into fabrication, add those as button mappings, and then go ahead and use the codes that are on here from our fabrication items that we want to use in its place.

AUDIENCE: Have you guys seen consistent naming from parts and pieces from engineering?

JOHN ASCHE: No, I mean, it's absolutely, 100% based off the families that are used. So you may find consistency from the same architect engineer, the same firms that you're getting files from. They may have their stuff already set up where they're using the same ones consistently. But, again, you can go online and pull down whatever content they're using, families are grabbing, and it's all going to be based off the way that stuff was created and built.

Unfortunately, hey, I'm going to be slick and get this all set up ahead of time and cover myself for all the different scenarios out there. you may be able to cover some bases. But you're still going to end up with some voids and holes here.

AUDIENCE: It might work for one engineering--

JOHN ASCHE: Exactly. Then you could load that exact same configuration up with a different file. And you may end up with zero things being converted over from your design parts to fabrication based off of what was used.

AUDIENCE: You can probably create a group to separate. Maybe a certain engineer can create a group with both button mapping to keep that--

JOHN ASCHE: Yeah, I mean,-- yeah, exactly. Exactly, or keep some stuff out in Excel with some stuff cleaned up, ready to go from different ones to try to expedite this process. And, I'll be honest, I don't know of anything coming down the line that's going to simplify this at this point in time. There

very well may be. But, at this point, this is what has to happen.

So once these are added inside of fabrication and you're in your service section area of the database, you're going to click apply, OK, allow the service.map file to update with those changes. And then you're going to go back into it and you're going to reload the configuration with these items added. And then you're going to go ahead and do your conversion process like we first started out there doing. And then you should see the generic items getting converted over from Revit parts over to fabrication parts, OK?

A couple of screen shots here of that first couple of examples I had inside of here. And now you can see, doing this process here, I've got a valve here with my flanges on it, a strainer, another valve, another valve with, again, all the proper connectivity on there. Same thing on the sheet metal side. I now have got my fabrication, sheet metal dampers, fire smoke dampers, fire dampers, et cetera. All those items have now been converted over to fabrication parts and pieces.

So, again, wish there was an easy button or a better way to go about that. But, at the same time, still, taking the time to do that is still going to be better, in my opinion, on a large file, taking the time to do that than manually going back and having to place every single one of those in there, one at a time, trying to figure out what's going on there. So a little bit of legwork up front. But on a large-sized file, it's going to be well worth it.

Again, I apologize. I know this is brief. But in order to get through all this, I didn't go too much deeper into the conversion process. I did put a link in my handout and in my presentation to take you to the help file inside of Revit.

And inside of there now there is a fabrication detailing in Revit that's there, walking you through a lot of this. So you're not left on your own like you were a lot of times with the fabrication products of not knowing how to do stuff and nowhere to turn for help. There is some stuff in the help file that goes deeper than what I just got into there.

So basically we're making the assumption here that you've gone through, you've made all your conversions, cleaned everything up. You've got everything converted over that you're concerned with from design parts over to fabrication parts. The next part of this that we're going to look at is going to be how to get the MAJ out of Revit.

The first thing I would suggest doing here is highlighting all your parts and pieces and then

using your filter tool inside of Revit to identify those parts and pieces that have been converted over to fabrication parts and pieces. One thing that some of you may be aware of, those who been working with it for a while, I just stumbled across this from a user in having a question the other day.

But what we what we found is the Design to Fabrication button, when he was selecting sets of items and he was trying to use the conversion from design to fabrication parts, if he had his tags selected when he made that, the design to fabrication button will not light up and allow you to make the conversion. So you have to be careful when you're making your selection sets inside of here for the design to fabrication. Because if you have the tags also selected inside of there, the Design to Fabrication button will not light up.

But if you simply, through the filter, just untick the tags box, boom, lights right up and it's ready to go and do what it's supposed to do. But it took us a little-- I won't say screwing around-- messing around to try to figure out why the button was not working and what was causing that. And that's all it turned out to be, is just simply the tags were in the selection set he was trying to convert over.

But continuing on here, make your selection set for what you want to pull out of Revit for your fabrication parts and pieces. And then there's a button right up here under the add-ins section of Revit and you can just go ahead and dump out your-- it says Export Autodesk Fabrication Job File. But, essentially, you're just dumping out your MAJ file.

So we're putting it into that file format that now can be used across all of the fabrication software products, right? So MAJ going from CAD to CAM to EST, back into Revit, for that matter, where we're getting that MAJ out of Revit. So we can now take it and start to do some other items with the information we've converted over.

You're going to go ahead. It's going to ask you where you want to save it. I might have thrown it on my desktop and gave it a name. And you can see down here you've got a MAJ file and it goes ahead and it dumps out an MAJ file.

And, again, that MAJ file, for those you who worked with the software long enough know that can go into CAD, CAM, or EST, as I said. So it's out there. It's now ready to go and take it to wherever you need to take it to from here.

One thing you may want to look at doing is taking it into CADmep if you've got hangers to

export out your Trimble points and then some of the other stuff that I'm going to show here. But, again, once we've got in that file format, we can pretty much do whatever we need to do with the other fabrication products.

This is something else that a user came up with. Pretty straightforward and simple but I thought it was worth noting. And what the user was trying to do is basically click on the Export Autodesk Fabrication Job File button before he was selecting anything. And he says, I keep getting this error.

It's pretty clear in my eyes as to what the problem is. But he was having an issue with it for whatever reason. So when you go to export out your file, before you click on this button right here, your items need to be selected down here first before you click on this button because it's basically saying take out what I have selected and put it in that MAJ file and do that. So it's not, click on this button first then go select your items. It's the other way around.

But, again, I figured it was a support question. I'd throw it up here to hopefully alleviate somebody else from stumbling on that or having an issue with it. So moral of the story here is just simply just select your parts you want first before you go ahead and try to dump out your MAJ. Yep?

AUDIENCE: That does not export a design language, correct?

JOHN ASCHE: Correct. That is correct.

BRYAN MILLER: Now, did they get rid of that toolbar where you-- because, previously, you could export the design line objects.

JOHN ASCHE: Now that I say that, I guess I haven't even looked, to be honest. But the old process of you export your graphical items and your design line objects and do all that, I guess, yeah, I'd have to look. But it's to go through the process run and then basically you would build your MAJ inside of CAD or EST. This is taking the MAJ out. So the other workflow, you would get your design line. But I'd say probably a few more steps involved with that one than this right here, yeah.

So inside of estimating, again, with us trying to get through this, I didn't dig in real deep with taking and modifying this and going through it. But there was some features that you may or may not have been aware of that were there or added in the estimating summary for 2017. And it was some stuff actually we had talked to the developers about because a lot of other

estimating packages out there have some options to basically quickly identify parts and pieces that are missing, pricing, labor, fabrication times, or installation times.

Where with fabrication, for those of you that are familiar with the ESTmep product, before this update that I'm getting ready here to show you, there really wasn't a great way to go about this. You can run reports to identify these items. You could do some sorting and filtering through your job browser-- not your job browser, but your parts browser, job contents, to identify these items and then manually go to each one of these items and adjust pricing, fabrication time, or installation time on them.

So it could be done. It wasn't that you couldn't do it. But it just there's quite a few steps there. And there was potential to easily miss items that did not have this information on there that you would want.

So in the 2017 release, under the estimating summary, there's three additional tabs here now that were not here in previous versions. I'm going to go through the review item costs and you'll see that all these work the same. But these three tabs were added in the estimating summary to simplify the process of quickly identifying stuff that was missing pricing, stuff that was missing installation times, and stuff that was missing fabrication times, and then, to take that a step further, allow the user to adjust fabrication times, adjust installation times, and adjust item costs if they chose to do so.

So, again, this was new in 2017. And there's these three tabs inside of the estimating summary. So these are default options. You can change this once you open it up. But it's automatically set to flag any items that have a list price of no price assigned to them or a list price of zero.

So they automatically are flagged in the estimating summary showing you, hey, these items do not have anything on there. They may very well be items that are not supposed to have pricing on there. But, again, by default, it's set to show you these items that are missing any pricing on there.

It's also set to collate or group the items together. So, again, that shows if you have 10 of the same valves, let's say that are missing price, and you can have it show you all, individually, 10 of those valves or just group them together and show you one line item and say, hey, all 10 of these same items are missing price. So you can uncheck those items by default, so you show

all the items and not just the items that are missing price and uncheck the items so they're not grouped together. And you can dig in there and see all of the items regardless of being grouped together.

So these are these options right up here that I'm talking about. And, again, they're ticked by default. And in this example that I have pulled up here, these were just joints that didn't have any costs assigned to them. But you can see it's showing me I've got 15 of these inch and a quarter solder joints, some weld gaps and some threaded joints that are missing price right here.

You can see they're pointing to a price list and the discount that's assigned to them. But they don't have any price that's assigned to them. So, again, it's just quickly to flag these items out for you.

Again, there wasn't a way to do this before. So that's the concept or the idea behind this, is this is just going to quickly identify anything in your MAJ file. And it doesn't necessarily have to come from Revit. It could be any file you've done inside here. By clicking on the estimating summary, it's going to show you the items that are missing this information.

AUDIENCE: Does that catch [INAUDIBLE] as well?

JOHN ASCHE: No. No, it's just on the ITM level itself. With those tick boxes unselected there, like they were there by default, you can see I can break out all my individual line items. They're not all grouped together. And then you can see I have the price right here and I have the option to go ahead and modify that list price or that zero price if I choose to do so. So it basically opens up your entire set of items that have been taken off in that MAJ file and it's allowing you to review this information inside of here.

One thing that I've found with all the different companies throughout Comfort Systems-- and I'm sure a lot of other companies are this way as well-- is all companies go a different way about estimating and have their own workflows, processes, and procedures that they like to use. And some users, depending on the items that have been taken off, they automatically know they want to adjust some pricing or some labor on it. And so giving them this flexibility to be able to do that really, certainly, helps simplify some things.

The other option that you have inside of here-- and this is similar to other filters throughout the fabrication products-- is you have a filters option inside of here. So, again, just for example

purposes, I just have a small list of items here to talk about this. But you can imagine, if you had a large take-off and you had your tick boxes unselected here, you may have a long list of items you're trying to sort through.

So you have filters that you can set up inside of here to filter down or look for a specific set or group of items that you know you're trying to modify and/or adjust for that matter. But a lot of people weren't familiar that that filter option was there. And you just simply have to right click on any one of these column headings that's up here and then this filters option pops up right here for you to build a filter to identify those particular items right there.

So once you select an item inside of here that you want to go ahead and modify the cost on, you can either highlight and double click on it or you can highlight it and click on the Properties button right here. And you can see right here a modified cost dialog box pops up. And, again, it's replicating. In this case, it was just a Nibco line item that I clicked on here. But it's just basically showing me inside here that it's pointing to Nibco and it's got zero price on there.

So right here, say I threw in 50 cents as an example. It would then apply 50 cents to all 15 of those inch and a quarter joints there, covering the pricing on those items right there. So, again, just a quick way to cover this stuff on the fly. Again, a lot of the estimators that I've worked with even on different equipment and valves and other stuff, people that have been involved with it for a long time, they can rattle costs off left and right to throw in there to cover themselves and off they go and not even bat an eye. So this just allows for that functionality to happen.

This right here is something I wanted to discuss here briefly. And this right here is just an instance of costing. So it would just be this one time. It would cover the costs on these particular items right here, like, say, in my 50 cents example that I used a second ago.

This area down here, there's a warning there. And you see it says database. And it says, warning, these values will be changed in the database. So the idea behind this, or the concept here, was simply the fact of if it's something that's missing in your database that you run into all the time or maybe you don't run into it all the time but it's something you don't want to have to deal with over and over again.

If you know what the price is or you want to throw a price in there that you feel comfortable with that covers that particular instance of that item, you can go ahead and you can put in a cost right here. And that will actually write the cost into the price list of that particular item. So it

basically takes care of it. It's done. It's over. You don't have to worry about it again.

One thing also worth noting here is this right here is controlled by the user's credentials. So if the user's just logged in as a standard user and doesn't have permission to modify the database, this will all be grayed out down here and they'll not be allowed to do that, OK?

So the idea here would be the estimating manager or maybe somebody in purchasing, however it may be set up, somebody that essentially knows what they should be can come in here and modify it. So that way your end users aren't just plugging in all kinds of prices and piling in that stuff in your database and making a mess of things.

AUDIENCE: Is that in a profile case?

JOHN ASCHE: If you were in a profile, absolutely. It would be just in that profile. Because it's writing it to the supplier.map and the cost.map files that are storing this information. It would be writing to that which are specific to a profile. If you are in your global database, then you'd be writing it to your supplier.map and cost.map in the global portion of the database.

This just goes through showing you the other options for the installation times. This is showing you basically the exact same options here. I didn't go through all the examples that I just went through, but it works exactly the same way as review item cost. So, again, it's just a quick way to review your installation times.

And then you can review your fabrication times. And you can see the dialog boxes, the filters, everything is exactly the same as far as that functionality goes. So, again, that's new to 2017. You may or may not have been aware of it. But it's a real handy way regardless of your workflow.

If you're not even doing anything with Revit, when bringing an MAJ out, you're just simply doing a take-off in EST. Or you've got something from CAD that was drawn up and you're opening it in EST, it's just a quick way to review this information and/or modify it if you choose to do so. All right, so now we're going to move on to taking that file and reviewing it with CADmep. And we're going to set our ductwork up to go over to the CAMduct software.

So CAMduct is a software that we use on the sheet metal side of things to write the files out to go out to the plasma and the coil lines for getting all of our ductwork fabricated and then built. This was already brought up a little bit earlier. But you will notice, when you first bring the

items, anytime you bring the items out of Revit and do the design to fabrication workflow or process, there is not a design line present in those items.

So if you choose to use design line, which I would highly recommend in order to get that design line in there, you have to use the Revit design command to do this. Again, I'll be the first one to admit it's not the greatest thing in the world to have to go back and individually do all these systems that you've dumped out. But right now that is really our only option for getting the design line in there and being able to utilize the functionality of design line.

The Revit design command can be ran in either ESTmep or in CADmep. That functionality is available in both software packages. So you can do it in either/or. And if you do it in EST, it's going to carry over to CADmep or vice versa. So you don't lose that. But if again, you're trying to use design line, you have to use the Revit design command to get that in there.

So this screenshot here is just basically just showing us some ductwork and some piping inside of an CADmep. And I probably should have turned my screen white to take the screen shots for you guys. But what I was just basically trying to show or identify here is I've got some duct work and I've got some piping and the design line is not present there and, again, having to use that Revit design command if you're going to use that functionality.

What I went ahead and did is isolated my services out, ran the Revit design command. So I'm just doing this one system at a time. And you can see it put the design line into my ductwork here. Same thing would be true on piping or plumbing. And I now have a design line present there to go ahead and use that design line functionality to start to get my hangers populated or whatever else I may be trying to do there.

When you go ahead and go through this process, you're going to basically go through and do that for each system that you have in here. So you're going to do this for all your ductwork, for all your piping, all your plumbing if you choose to do so. You're going to go ahead and then take the file from here and go through the coordination process, OK?

Again, we're not going through all that. There simply isn't time. But, essentially, you're going to go through, you're going to get all your stuff in there, you're going to get it coordinated and ready to go. And then that's when we're going to go ahead and start to look at comparing this stuff.

So what we would have done inside of estimating, or inside of CADmep for that matter, is gone

ahead and ran a report. I just did this on the ductwork as an example here but you can see before. So you brought it directly out of Revit, or you just did your initial take-off inside of ESTmep for that matter. You can go ahead and run a report.

This is just a report that I ran inside of here. You could run whatever report you chose to do so. But, essentially, what I wanted to point out here is you can see here I've got a quantity of fittings, a length, an area, a weight, shop hours, field hours, and a material cost. And this, again, would be before coordination or after it was estimated. And then what we can do then is run that exact same report on those items once coordination has taking place, OK?

Most of the time, again, especially if we're going from Revit, knowing that everything's probably not going to convert over nice and neat and there's going to be some holes and some voids and stuff there, I would imagine the majority of the time these numbers are going to go up right here. And when I went through and got everything cleaned up and converted over, I didn't coordinate this whole thing. But got it all cleaned up to where it was supposed to be for the systems that I had exported out.

These were the numbers that I ended up with. But, again, the idea of the concept here was just simply the power of the reporting capabilities inside the software, being able to run that report before coordination or after the estimate and then after coordination right here, so just running the reports to be able to compare this stuff and see where we're at.

All right, for those of you that have done this before, this would be pretty rudimentary for you. But we're going to go ahead and go through the renumbering process to take the ductwork out of CADmep and then get it over into CAMduct. So we're just simply going to run the-- oops, wrong button-- the renumber command, put in our numbering sequence that we'd like to use here, again, depending on whatever numbering sequence your company is using or is looking for there.

And, again, should have had this set as a white background. it's tough to see. But my duct work has all got numbers on it inside of here and now is renumbered and would be ready to go over to CAmduct. There's a bunch of options with renumbering that I did not go into. And, again, I have a little link in my handout here to the help file that goes through all the different renumbering options that you have available to you to really clarify that for you.

Using the command, create CAM, you can also do it through your CADmep menu on the screen. But essentially we're going to use create CAM. And, again, we're going to dump out

the MAJ file out of CADmep into CAMduct, OK? So, again, we're utilizing that same MAJ file to do this.

So you dump out your create CAM. For this, I just dumped it on my desktop. You're probably going to put this in your project folder. But basically you're going to dump out your MAJ file and it's going to be ready to go then into CAMduct.

Once the MAJ file is out, we can, either through the job browser or through the open job functionality instead of CAMduct, go ahead and open up that MAJ file. So we've gone out of CADmep into CAMduct. And you can see here then is all of our ductwork from CADmep over here into CAMduct now ready to go out to the plasma table and to the coil line to start to get fabricated. So you can see that that MAJ file can carry through from one package to the next here.

All right, I didn't have this in here originally, I'll be honest. But sitting back, I just wanted to reiterate this. I guess some of us may take it for granted. I think it's just it's unbelievably awesome to be able to utilize this database and this functionality across all these different software packages.

I mean, if you think about it, we have the same database, same functionality, that we can utilize inside of Revit that we can utilize inside of AutoCAD or AutoCADmep with CADmep, ESTmep, as well as CAMduct. And that MAJ file is carrying it from Revit through any one of those other software packages. And then, ultimately, if we choose to do so, it could go back into Revit if we want and utilize that MAJ and that database information inside of there.

Having that MAJ file going across all the different software packages is absolutely-- I'll use my word here-- key to this process and utilizing that database that all of us have spent probably countless hours and time working on and setting up and using and probably work on a daily basis. But having that power is just awesome in my opinion. So that's all that's all I got for you. Has anybody got any questions? Sure.

AUDIENCE: Packages that you have transferred into your fabricatable part in Revit, can you just take it from Revit right to the burn table?

JOSH ASCHE: Absolutely. So once that MAJ file is out of there-- yeah, so I just tried to highlight this round-tripping process, if you will, from one to the other. If I started in Revit, did my design to fabrication parts inside of there and then had that all done and cleaned up with whatever I

wanted to do, as soon as I dumped that MAJ file out, yes, by all means, I could have gone right to CAMduct, opened it up, clean some stuff up in there, make changes, modifications, whatever, and then, yeah, send that stuff right out to the table and/or coil line.

AUDIENCE: What with CAMduct, [INAUDIBLE] from Revit to the table? It has to pass through CAMduct?

JOSH ASCHE: Yeah, so camduct is going to be the software package that writes all of your .mp files or your TAP files, on your DEC files, the files that communicate with the coil line in the plasma table. That has to come through. That's going to come through CAMduct, taking the information out of the MAJ file and putting it into the files that the plasma table and coil line can read. So that's what's basically doing the conversion to put it into a language that the machines understand.

AUDIENCE: Is that software available in Revit?

JOSH ASCHE: No. No, so it's a completely different-- it's a part of the fabrication line of products, the CAMduct is. But it's a separate package from Revit. So we can take what we set up inside of fabrication and utilize it inside of Revit. But if I want to then take it out to the sheet metal shop and burn my duct out and send them straight to the coil line, I have to do that through CAMduct. Yep?

AUDIENCE: Your coordination process doesn't happen in Revit, it happens in CADmep. Is that coordination [INAUDIBLE]?

JOSH ASCHE: So I did that, again, just for example purposes here. With the functionality that we now have, that coordination very easily could have taken place inside a Revit if I chose to do so. We have a company right now, actually this guy's company right here, EAS, doing-- I don't have the file handy-- just a massive project with all fabrication parts inside of Revit, full coordination, hangers, everything else.

Only thing they've taken the file out of so far for what they've got installed is using CADmep, get the Trimble points out to be able to do the field layout, and then over to CAMduct to get the ductwork burnt out. But all of the coordination, spooling, renumbering, all these things that I was doing in CADmep, just as example purposes here, is all being done inside of Revit, utilizing the fabrication parts in there.

AUDIENCE: OK, so in short, you can eliminate that step by going from Revit directly to CAMduct?

JOSH ASCHE: So, yes, I could have did everything inside of Revit, got everything coordinated and ready to

go. And then, from there, yes, I could have skipped going to CADmep, if there wasn't a need for my workflow or my process, and gone straight to CAMduct with the ductwork to be fabricated.

AUDIENCE: Just one last question. When it comes to certain plans that arrive late [INAUDIBLE], can you [INAUDIBLE] something for conflicting [INAUDIBLE] or some items that's late arrived and you don't have the actual dimensions of?

JOSH ASCHE: Sure, so there may be some field verifications where we're going to get some much fabricated and leave a gap between the end of the run and the piece of equipment that we're hooking up to so it can be field verified, absolutely. That sort of thing happens quite a bit, where we're going to try to do as much as we can inside the software and utilize all that information we have here and then try to leave that field verify piece or that gap as short or as little as possible. Yeah?

AUDIENCE: So, for the process, do you guys still draw in Native Revit or did-- because I don't think you can draw as simply as you can-- because you can add pieces and stretch lengths of pipe--

JOSH ASCHE: Right.

AUDIENCE: --fabrication parts.

BRYAN MILLER: We try to keep it as long as we can. We keep it as designed pipe and designed pieces because we have to give it back to the client. We send a submit allow. They approve it. It comes back to us. So once you make it a fabrication part, it becomes a lot harder to adjust it.

So we keep it as a design as long as we can until we get it approved for submittal. Then we'll convert it to fabrication parts and go back through and make sure everything's tweaked out perfectly.

JOSH ASCHE: Yes.

AUDIENCE: So I understand here at the end of this class, Revit 2017.1, everything that's gone from Revit turns out to be, at the end, a fabricated model of duct, plumbing, correct?

JOSH ASCHE: Yep, yep.

AUDIENCE: [INAUDIBLE] fabricated. I mean, this is wonderful because trades now they can come to the central ports of design and coordination and use that model that can be used for also the

order, [INAUDIBLE], or everything and they have that model for fabrication. It's wonderful. Is it working perfectly well?

JOSH ASCHE: It's working. And as far as the fabrication parts go inside of there, it's working. But there's still a lot of functionality that needs to be added to make it as robust as users are going to want it to be compared to what they're using inside of the CADmep software, the tools, and functionality that's there. There's definitely some enhancements and functionality that's going to need to be added to continue to push that along. But to answer your question, yes, it is working. And as this guy's company is doing now, Bryan's company, they're doing it all directly inside of Revit.

BRYAN MILLER: We couldn't do it at all in 2016 with fabrication parts. Now we're in 2017 and we're doing it. And just like everybody saw this morning, it's all about fabrication right now. That's where Autodesk's push is. So it's going to keep getting better and better and better.

AUDIENCE: But you still need the fabrication software, the AutoCAD software, to set up the services for Revit. It doesn't base Revit with fabrication--

JOSH ASCHE: I think, by default, you do get-- when you install Revit, even if you don't have fabrication on there, there is a select set of components and services that are in there and available. But in order to do anything with those services, modify them, those button mappings, all the stuff I was going through, you have to have your fabrication database to be set up inside of a CAD, CAM, or EST, make the changes, and then utilize that inside of Revit.

BRYAN MILLER: You have to build a profile.

JOSH ASCHE: Yeah, Yeah.

AUDIENCE: You showed some reports in your presentation earlier.

JOSH ASCHE: Yeah.

AUDIENCE: Are those reports the same ones from fabrication? Or are those ones you have to build in Revit?

JOSH ASCHE: So, no, those were reports that I ran inside of fabrication. Yeah, yeah, yeah.

AUDIENCE: Are you able to run reports in Revit?

JOSH ASCHE: You have schedules which you can run inside of Revit, which I guess you could say is pretty

comparable to a report if we're going to try to compare those. However, the print objects that are available inside of the fabrication products, the level of detail and all the things we can do inside of fabrication, we're not going to be able to quite get to that same level yet inside of Revit.

So you're going to be to, to a point, get some information. But you want to dig down and really get into some of the nuts and bolts, literally, that we have that we can do with fabrication. Probably going to have some struggles inside of Revit. Yep?

AUDIENCE: Based on experience, what was the learning curve for someone, fabricator, duct, or plumbing? What was the learning curve for that person or that company to use for Revit 2017.1 fabrication?

JOSH ASCHE: So if it's an existing Revit user, the fab parts work and behave very similar to the way generic Revit parts and pieces do. So if you're a Revit user already, using the fab parts, you're going to catch on very, very quickly and be able to run with it. If you've been in the AutoCAD world most of your life, AutoCAD, AutoCADmep, then there's going to be a much greater learning curve going from AutoCAD over into Revit, trying to do the same thing.

BRYAN MILLER: And I can elaborate on that a little bit as well. I came on board with EAS a year ago last October and they weren't using Revit. And now we're doing this in Revit. Yeah, we have some pretty smart guys, though.

JOSH ASCHE: Yep.

AUDIENCE: Question, like a retort for the take-off. Once you convert them fabricatable parts in Revit, will it run max good take-off for the duct and you can send just the take-off sheets to the shop and [INAUDIBLE]?

JOSH ASCHE: Yes, so if you converted the items inside of Revit to fabrication parts and pieces, there's reports that you can have set up inside of fabrication to basically show you-- let's use a rectangular elbow as an example. Show you your rectangular elbow, identify the throats on the elbow, the lengths of them, basically all the information an outside fabricator would need to fabricate those particular items. But those would all had to be set up and built and identify all those different fittings and snares that you may have to give them that information.

AUDIENCE: So it is more customizable than pairing up on take-off?

JOSH ASCHE: Well, to be honest, it's been quite a while. I don't know what the out of the box-- when you buy the software-- reports are that it comes with. But if they're not there, which I don't think they are, you can certainly build those reports to provide the fabricated information they would need to build the ductwork.

AUDIENCE: Also, you took a year to switch over everything, you think, from CAD to Revit. But do you think they-- [INAUDIBLE] and think they were able to do the same for activity level?

BRYAN MILLER: Well, everybody learned at a different level. We have some we have some really sharp guys that fell right in. They've been using 3D AutoCAD for years and years and they learned pretty easy. We have other guys that are different levels. But, I mean, department wide, this is how we do it. We do 100% of our projects in Revit now.

AUDIENCE: But has it increased productivity?

BRYAN MILLER: Well, there's always a learning curve. It will be. It's getting better and better and better.

JOSH ASCHE: The user friendliness-- again, this is from me, coming from an AutoCAD world-- of Revit is much, much greater, I think, the things it does. For instance, I grab a run of duct or a run of pipe or a branch line coming off a run of duct or a run of pipe, I move it over. All the parts and pieces move together, OK? My hangers come with it. If there are structure differences, my hangers adjust.

In AutoCAD, that doesn't happen. I got to move it. I've got to move over one piece at a time or grab a section of it, move it over, move my hangers over, adjust everything. I got to do that all myself. Where, inside of Revit, it's smart enough, I guess I'll say, to understand that when I move that over, hey, I don't want to just move that one fitting or piece over. I want to move the whole branch line that that's connected to over at the same time. So there's a lot of built-in functionality that you do not have inside of the AutoCAD environment.

BRYAN MILLER: It's a little more intuitive in Revit.

AUDIENCE: Can I just ask? Again, with ducting, I know with duct it's a no-brainer. But just in relation to the piping, without the [INAUDIBLE] I use industry standard isometrics. What's your output in relation to piping? You're saying you're doing them both with ducting and piping?

JOSH ASCHE: So, for your piping, you're going to build your spool sheets, your spools for the piping, and then that's how you're piping-- well, ideally, you're going to build your spools and that's how

you're piping's going to go ahead and get fabricated.

AUDIENCE: So it's a 2D drawing, essentially?

JOSH ASCHE: No, it can be a full 3D drawing with dimensions on it identifying the building materials saying you got one six-inch inch elbow, you got a three-foot piece of pipe, you've got a weld. All that stuff is going to be on a spool drawing.

AUDIENCE: That's an industry standardized sketch in line with--

JOSH ASCHE: So I guess it would just depend on what you're trying to set it up for. You could set it up as a single line inside of Revit, if you wanted to do that. Or you could have full 3D parts and pieces and components in there if you wanted to go that route. It would be entirely up to you what-- I guess, whoever is fabricating your pipe or plumbing for you, what they are looking to see and how much information they required to get the job done.

BRYAN MILLER: And we typically give them a full 3D iso. We don't use a single-line drawing for spool drawings.

JOSH ASCHE: Right. Yep?

AUDIENCE: Did you take time to make your Revit standard pieces have the same dimentionality as your fabrication parts so that when the conversion happens there weren't so many holes?

JOSH ASCHE: Not yet. Not yet.

BRYAN MILLER: We haven't.

AUDIENCE: Do you mind doing that?

BRYAN MILLER: Just like this is new to Revit, it's still new to us. But we're here.

JOSH ASCHE: I think, yeah, as it progresses, I mean, any little shortcuts you can build or take the time to do is definitely going to be in your favor to make this process that much easier and more and more efficient. So all right, thanks a lot.