JAROD SCHULTZ: Well, thank you ladies, gentlemen for showing up for my class. You've got hundrds to choose from, right? But you chose mine, which is awesome. So I appreciate you guys taking the time into picking my class. I'm Jarod Schultz. I'm design technology director with initial.aec. Check me out on Twitter. I got blog-- I don't know. I'm all over it.

So what's my agenda and hopefully everybody saw my handout. I try to give you guys all kind of an idea of what's going on with this class. So it's Design Strategies with FormIt 360. So, we got another design solution called SketchUp and we all know that designers love it and use it, but we all know it's a throwaway, and so the idea is I'm trying to show you guys in a bigger picture of all the different things that would help you either modeling-wise, implementing-it-wise, understand how it interacts with SketchUp very, very well.

Anything that's kind of done in SketchUp can be brought in to FormIt, and the big thing, too, is that then FormIt goes into Revit. There's no throwaway, and the other thing I want to make sure everybody understands too is Groups are king. Groups turn into families. You can do all kinds of cool things with this workflow. So, at the end of the class, I'm going to try to give you guys all of this information. I'm also going to throw in here Insight 360.

So as I'm kind of flushing things out and kind of giving you ideas of how to design things and model things within FormIt, I also want to make sure you guys are taking advantage of Insight 360 and the toolset that's available there, and we'll also kind of get some ideas of FormIt to Inishgt 360 and what's available, what's not available, and also, then, if you just do a few extra picks and clicks and take the FormIt model into Reit and then go into Insight 360, what else it gives you-- because it does give you more-- with that workflow. So I want to make sure that you guys understand what's going on with all of that.

The first thing of all things is if you're going to help and get your designers or yourself, and I'm just curious-- a couple of things before I get started. First of all, who's first AU? Just curious. Almost 3/4. All right. All right, who's used FormIt? Awesome. OK.

So there's parts and pieces in here that I might speed up, OK? There's other-- Kimberlee and Mike and a few others-- Carl-- are doing FormIt classes also and you can learn more about some of the basic stuff. I'm going to try to show you some of the tips and tricks working with some of the more advanced tools along with it, but the key ingredient when you're working with any of this is you guys gotta get an A360 account.

So your SketchUp user or whoever you're trying to work with to try to get them to start using this toolset, you gotta get them an A360 account because the beauty of FormIt, right, is, yes

there's a Windows version, which is a pro, and I typically-- if you're going to get into this, you're going to have to go down the Pro version. The web browser version is very robust. The iPad version is very robust. The Android version is very robust, but if you're going to work with Insight360, solar analysis, collaboration, the materials library-- as for the Autodesk materials library, you need the Pro version when you're doing some of this-- but all of this information and the beauty is that it doesn't really matter where you start working with the model. If you do it through the web browser version, then when you get into the office you can pick up that model and start running with it. You just need to understand that, in your A360 account, it's all going to go to this FormIt folder.

So it creates this automatically. You don't have to build it. It just does it, OK? So that's the big thing.

The other thing is you've got to get the Add-Ins installed. Just go up to FormIt 360, download it. It's for Revit '15, '16, '17. So you gotta download those, you gotta get those installed, OK? So, working with these workflows, you have to have these Add-Ons, all right.

Tobias-- talking about Tobias, there he is. He's on the development team with FormIt. So I'm kind of-- to be honest, I'm spoiled rotten. I'm in Denver.

The FormIt team's right out of Boulder, so I work with Tobias and Josh and Tom that's out of Boston very much, to say the least. I think I'm talking to those guys every week. Maybe too much, but you gotta work with these tools.

So these tools give you the ability to take SketchUp into FormIt. So we'll talk about that workflow. If you've got Revit families, that's a workflow. That one actually does a roundabout. So if the RevIt family has been converted, you use it in FormIt, it comes back to RevIt, you can basically update it so it goes back to the original Revit family. What it does is basically gets back all the types is what it does, and we'll talk about that, and then obviously the big thing is nothing's being thrown away because FormIt talks with Revit, and there's some different things that you can do with Groups about how it does talk to Revit, and that workflow is going to get even further along as we go.

That's basically what the Add-Ins looks like on the dropdown. So nothing too magic there, nothing too rough there about learning any of that stuff to be honest. The big thing, though, is that for a SketchUp user, if you work with them, they probably have a very robust Entourage library. Trees, people, cars-- they've probably spent time implementing, working with this,

updating those.

Just understand that some of those things like furniture that they worked on or got from 3D Warehouse might have watertight issues. So understand FormIt and Revit's kind of a solid modeler, to be honest, at the end of the day. There's a toolset that I'll show you here in five seconds that shows you where those issues are. So just a heads up. So if you do bring in some of that content converted or whatever, you might have to go back through and work on some of those surfaces.

So if I jump back and I look at FormIt for a second, this is a design model. It has Groups in it. We'll talk about what's going on with Groups. It's got layers. If I bring on the example units here for a second, there's a display mechanism built into the software and if you go up to the Visual Styles, it's basically watertight issues. If you turn this on or use your shortcut key of dw, it'll basically flag it.

So, like this here, this bed, at some point was maybe a SketchUp model that came in and that's something that we might have to address. If this is something that's going to be converted and wants to get brought in to Revit, we might need to work on that, OK? So there's something with that surface where it's not watertight, OK. At least we got something built into FormIt to show us where those issues are.

So if you ever do something like this and you bring it into RevIt and you're like, why is this thing not converting right? It's probably because of this issue, OK? So you might have to address some of this with some of their content OK? So just a heads-up as you're working with this.

So that's something you gotta be aware with but, to be honest, I don't know if everybody knows the backstory of FormIt, but just understand that when Trimble bought SketchUp there was three core developers that jumped ship and came over to Autodesk. That's how we got a hold of FormIt. That's why it works so fluidly with SketchUp, OK? So if you don't know that story, that kind of gives you-- what did they do here? Well, they got the developers that, in essence, kind of built SketchUp over the years.

So that's why it works so well, and these are just some examples that I wanted to show you based on that toolset. So you can see here we have a SketchUp model. This is what it looks like when it's in FormIt.

So the other beauty of all of this-- I've got some designers that have used SketchUp for 10

years or more and they've spent time with their materials and made their trees look beautiful. All those materials come across perfectly into FormIt. So all of that time that they spent is not being thrown away in any way.

So I think that's a big hurdle. So when you're telling them that, hey, let's try out this other design tool, that's probably one of the first things they're going to throw at you. Well, I don't want to abandon my library.

Well, you're not abandoning anything. We can bring all that across, and we'll talk about how you can work with a library. There's a library tool with FormIt, but you don't have to deal with a library if you don't want to.

In Revit, if you've converted your families, those families come into FormIt. We'll talk about, when we get into the library piece, kind of what that looks like. If that family comes back into Revit, there's a tool to convert it back to the original family. It's just dealing with types is what's going on and you'll see this, and this will make a little bit more sense once we show you what's going on with the library.

Like I mentioned with the SketchUp content, if they've got a ton of stuff, hopefully they at least break it out into some normal folders for you, like people are in a people folder and trees are in the trees folder. We would cross our fingers maybe. Maybe I'm dreaming. Sometimes I'm [INAUDIBLE]. Maybe it's just a big fat mess, but either way there's a tool to do a conversion in a multiple fashion.

So if they got, I don't know, 60 different plants and that needs to be converted, just understand this tool will do a multiple conversion, OK? I personally like to dump the converted format files right in the same folder where the SketchUp files are. I like to have that intermixture because they already know where that folder is, so why have to teach them a new folder structure? They can just jump right where they are before.

Also, too, there's nothing stopping them to actually adopt to a library. I mean, it's nice, obviously, if we have content that everybody should be using, but this is sometimes, when it comes to designers, very individual, to say the least. So this might or might not fly. It is available to you guys, but just understand that you have an import 3D model which you can convert the file format to SketchUp and you can just bring in SketchUp content literally right on fly.

So if they're used to that workflow, where, hey, I just need this particular tree, or this particular person, or whatever, don't disrupt that work flow to them. Don't say hey, you've got to use this library. Implement the library, whenever, in the background as you learn more about what's going off their content, start building that for them and it just magically starts appearing.

When you build that folder structure, just understand there's a plus button. You go in there. You can see here, you can have more than one path. But just understand if it goes to one main folder, and all the content folders, and underneath that, it reads that, and I'll show you that here when we get into this. So let's look at this a little bit more. So when let me go open another file. So I got some multiple different files I want to show you guys as we go through this.

So in this example, some of these trees came in from SketchUp, and one other thing, it's just a subtle trick. Who works with Revit too? Just curious. OK, everybody and their brother. All right. Everybody knows this trick, right? That if you pick on something it kind of centers the orbit. I would hope everybody knows this trick. If not, I guess I just blew your brain. I don't know.

[CHUCKLES]

FormIt does it too. The other thing, if you hold down the Shift key in the wheel you can do that. This was here, and then it got broke, and now it's back again, I'm happy to say. Some SketchUp users are going to be used to just using the right-click to do the orbit. All right? And now I'm getting all confused because I jump back and forth between it.

AUDIENCE: Does FormIt use the same? Because I know SketchUp uses different key commands to orbit. Does FormIt use the same ones as [INAUDIBLE] that always messes me up.

JAROD SCHULTZ: I think Tobias can answer. I think they're close, but I don't think they're exact, though. Tobias is still here or not? Did he run away. He ran away. So yeah, you'll see this today. I'll jump over to Revit, and I'll hit my right-click to try to orbit, and it's like oh, I'm getting a right-click menu. Oh, stupid me, shift key. Here I go so, but just understand that that's available.

So the thing is, you don't have to use this library tool. I like it. If you do convert your Revit families over, just understand the types will come in like this. So it does take advantage of all the types in your families, it's just a drop down when you're dealing with it. If I come in here and pick on my actual library, and this is the plus button. This is where you add the pass, and by the way, if they want to, the library can live in A 360.

So if they're working on their iPad, if they're working on their windows version, it could feed off all the same library if they wanted to. So that's an option. So just a heads up. But mine's going into a main folder. So what does this look like? Well, you can see it sees the sub folders automatically. I didn't have to build any of that, I just built the folders, of course, but it builds the tiles. And if I pick on the trees, then here's my trees.

Now, I can do it this way. I can bring this in, I can place it, and off I go. If they're more into that's not how I'm used to doing it, well, that's fine. You just show them how they can just grab import, switch this to SketchUp, grab that same tree, except it's a SketchUp tree, and then they can just bring it in and place it wherever they want to place it. Either methodology would work, it's just up to them. All right?

A nice little trick that I learned, the SketchUp tree here, it's flat, and this little trick-- just to give you guys an example, what I did here is I rotated this, basically three times. I like this trick, it kind of gives it more fullness to it. The shadows, if I-- I'm getting ahead of myself a little bit, but the shadows look really nice if I do it that way. So just a little trick. So maybe enhancing the SketchUp content a little further than what it is, instead of it being flat. So just a couple of things.

So it's up to you. You can implement this library over time. In that they can just grab import and just start going for it. OK? And where did my trees come from? The 3D warehouse. So I went up there and went, hey, these are really cool looking. And all those materials, all the materials that you're seeing, that all came in from SketchUp. I didn't do any of that. All right, all I do is I just open it up and rotated a few times.

So some enhancements there upon the SketchUp content, and then like I said, the zoom and orbit shortcut keys. I'll try not to use the shortcut keys as much as possible. I'll try to get them off the menu, but I'm very much into using shortcut keys. If you have the pro version, you can actually customize the shortcut list. You can export it out, you can import it into other machines, so on and so on.

Drawing things--

AUDIENCE: What about bringing in the content directly from SketchUp files? When you bring that into Revit, does it pollute the model in any way [INAUDIBLE] AutoCAD does?

JAROD SCHULTZ: We'll talk about that. No, short answer, no. I'll talk about it. There's a wonderful thing that FormIt and Revit do. It's called groups equals families. So it's pretty nice. Just going through it real quick since you guys kind of worked with FormIt. Drawing lines, the precision is all there. Alignments are all there. I don't know, hopefully everybody knows if you hold down the shift key FormIt, basically it flips it into an ortho mode. So horizontal, vertical, straight up, either way.

When you close the shape it turns into a surface. If you pick on the surface it turns into a push-pull example, which basically turns it into an extrude. From there you can use your tab key. So for you that work with Revit, it's called tab, tab, tab your life away in Revit. Some of my clients are like, Jared, is there a way to get rid of the tab, tab, tab, my life away? Well, here's even more tab, tab of your life away.

So FormIt's into tab using also. So in this case, if you want to do precision, I like to use the Tab key. It pops up a little dialog box. You can punch in the number. By the way, FormIt 10 is 10 feet, so just like Revit. OK? If you want 10 inches, you got to get the inch mark in. OK? So just a heads up with that.

Layer's, obviously just like SketchUp, we have layers in here. When you draw things, nothing gets put on a layer. So there's nothing-- I'm going to, of all things, I'm going to bring up AutoCAD. There's no such thing as layer 0. OK? When you draw things in FormIt, it's just on no layer at all. So it's up to you as you want to do visibility control, either for yourself, or through your scenes, it's up to you to pick on that information, and put it on the correct layer, and then you have the control over turning it on and off whenever you want. OK? So yes, we do have layers, and again, if they've used layers in their SketchUp stuff, that comes along for the ride. OK? So all of that's fluent as we're working with it.

Aligning edges, like I said, if you hold down the Shift key, it kind of locks it in. You can pick a point up way off somewhere else to make it align, which is great. So remind yourself of the trick there. There is a tool to actually taper things. I like to just pick on edges, and just push and pull from there. One of the things I want to mention, as for the push-pull technology, it's push and pull based on a surface, an edge, and even a point. So I could pick literally onto the corner of that point and stretch it wherever I want to go with it. So you have all of that control factor as you're working with it.

And then the other thing is, FormIt does an awesome job of understanding where you're at. So

when you grab a drawing tool, whatever that drawing tool is, it very, very quickly understands that hey, you're on this surface, you must want to draw on this surface. It very much assumes a lot of that, and does a very good job of doing that for you. There is a tool in FormIt where you can change the work plane. So if you want absolute control, saying no, FormIt, I want you to only look at this surface, and only this surface.

If you right-click-- and this is the biggest thing with FormIt, when in doubt, what do you do? Right-click. There's a lot of right-click menus going on with FormIt. OK? So understand that if you right-click, you can grab the work plane tool, you can pick it wherever you want, you can rotate the axis around wherever you need, and then you have complete control. Even though the axis is on that surface, you can still pick points through the grid.

So if there is a point in the back of where that surface is, you can still align to it. So your object stamps are still free to go wherever it is, it just knows that hey, when you draw that line, don't go off into that back point, stay on this surface. OK? That's one of the reasons why they came up with the work plane tool, is to just give us more control over that.

All right, so I blurted all that out. All I'm going to do at this point, and I'll do it real quick since a lot of you worked with FormIt, but I just wanted to make sure that I wanted to go through-- and I'm just doing some shortcut keys just to turn on the grids and stuff. The line command is just L and hit Enter. Again, if I want to do precision, it's basically the Tab key. I just typed in the Tab key, type in whatever distance I want to do, hit enter. Obviously, you can zoom and pan around if your mouse is acting normally. So my Dell mouse sometimes likes to not think I'm doing that.

And so I can just come in, type in, flush out whatever I want to do. Obviously all of this can be changed at any given time. Once you go back to that, it builds the surface. I can pick on it. Once I pick on the surface, then I can push and pull it. Again, I can type it in what exact distance I want to do on all of that. I can come in and pick on an edge, and maybe I want to taper that back. Again, if I want to do an exact distance, I can hit the Tab key.

The other thing that FormIt does, which SketchUp sometimes does a really bad job with this, is lines on top of lines. Now, FormIt doesn't get bogged down with this. If I literally want to start a line saying, hey, I want to come down-- and notice how it's just picking up on that edge-- and I want to come down 14 feet, and then I want to come over 14 feet, and then I want to go straight down from that.

You can see how it's automatically picking up on the edge, it's picking up on that surface, but there's not a line on top of a line. It's not going to freak out on this. So just a heads up. So it does things like this. Sometimes it's not something that you always want to do with SketchUp at times, but when it comes to FormIt, it's not really having an issue if I come in, and want to draw something off of this distance, and then come down. At the end of the day, yes, that's an edge, but it's not two lines. It's just a single line.

So you can see I can very quickly build things onto surfaces. I can select on this. Maybe I want to push this in five feet. Dealing with the alignments, again, I can grab the line command. It does a wonderful job with picking up on what I'm trying to do here. I mean, I'm not having to do any extra. I'm just doing a single escape, by the way, to jump in and out between the lines as I'm drawing it. I can pick on the surface. I can push this back in five feet if I hit the Tab key.

All right, so now I'm getting more of what I'm thinking of as for what I want to do for a facade. Maybe over here, I want to do something a little different. Again, maybe I know that I want to come down 10 feet. I want to come over eight feet. If I go R for rectangle, it will help me start drawing a rectangle. Maybe I push this thing down. I don't need that extra line, so I pick on it and delete it. I pick on this, push this in if I wanted. Maybe I want to do that five feet.

Here's a wonderful trick, by the way, if I want to take this and push it all the way down, I don't have to build something else to subtract or whatever. I can just pick this surface and just push all the way down. It just instantly subtracts. I love that. All right? Someone from a design standpoint using SketchUp might think extra about that, and it's like no, just pick on the surface. Just push it down. You're done.

OK, so very quickly just laying this out. Let me save this real quick because we'll continue on with this model as we go through it . And we'll call this Fun Times. All right. We're all him fun, right? This is cool. Or maybe not, FormIt sucks. I would hope not. I love FormIt, man. And it's just like, man I'm just trying to get my clients to change their workflow. That's the battle I'm running into.

Sweeps. So I want to go through, talk about sweeps. Give you some ideas about working with designs with this. Lofts, giving you some ideas of how to do that with some design strategies. This is very unique. I've never seen a tool like this. It's called cover. So getting back to that piece of furniture that had that watertight issue. Well, ultimately to fix that, what I'm going to do is go back, pick on that surface, and just delete it.

And then what I can do is go back, look at what's going on, and then to put that surface back on there, they have this awesome tool called cover. And a lot of times I tell people, when you want to put a surface back on top of something, grab this tool. You are thinking, oh, I got to go edge, edge, edge, edge, right? No, no, no, no. Grab cover, pick one edge, hit Enter.

More than not, it'll find the boundary and just do it. If it doesn't, well, OK, I got to go pick, pick, pick, pick, and then hit Enter. But a lot of times you can do a single edge and it'll find the boundary automatically for you. So when you're trying to-- a lot of times you have to delete surfaces, look inside, clean up some things maybe that's going on, and then how do I put that surface back on there, it's just called cover.

Offset, when this thing came out, this is like yay, I can finally go from mass to a detail model very quickly. So this is just picking on a surface, right-clicking, telling it what the offset distance is. Obviously, you can see I can go from a mass model to something that looks like walls very quickly. You can also do this with parapets. All kinds of different ways, and the more you start fooling around with the offset tool, you'll find all kinds of different places where you can use this.

And then they came out with Shell. That was earlier this year. They came out with this and this, because this-- I started fooling around with this. I'm like, this is awesome guys. I like this, but when I get into something that's got all these tapered edges, and sloping, and is curved, the offset might not be working so hot in those examples. The shell tool, basically what it does is you pick on the surface that you simply just want to completely delete, which is typically the floor, the bottom floor, and then it asks you what's the offset. It defaults to negative one foot, and then it basically shells everything out in about, I don't know, half of a second. I mean, it's super quick.

So again, sometimes people are starting to look at FormIt and think, oh, it just does massing. No, no, no, you can geek out just as bad as you can with SketchUp, with FormIt. There's plenty of examples up on their site where people are totally geeking out with it. The array tool, again, I'm showing you stairs, but you can do it with your sunshades, something maybe where you're trying to convey wall, design intent.

All of this, when you're working with this, by the way, this groups. So if you change one group, it automatically updates. If I developed this shade, and then I array it, this turns into a series of groups. If I change one, it changes all of them. You can select on one, make one unique if you

needed to. All right? So you have options there, working with your array tool.

And then one other one. Just put this one in your back pocket. This is kind of before we had groups. So one of the developers decided hey, we've got to have the ability to go out there and pick like surfaces. So in other words, surfaces that have the same area to them. So it's just a fast selection tool, and I'll show you an example. This is where I kind of was flushing out this window frame, and instead of me going in there and having to pick all those little skinny surfaces on there, to push and pull on it, I hover over one, hit the tab key, and it grabs all of them. And then I can pick on the surface and yank it in and out, and I'll show that to you.

So this is a nice one to put in your back pocket, that if you have surfaces that are the same size, instead of you sitting down and going pick, pick, pick, you can let FormIt basically do that for you. So jumping in. Let's see here, I did save this, but I'll save it just one more time just in case. But if I go in here, and let's open up this guy. So I got a bunch of different examples here of what I just mentioned.

So, what we have here is we kind of got a before and after scenario. So basically, this is dealing with a suite. So just understand going further, I'm just going to type in SW at this point. So the idea, the concept is you basically are taking a profile. In this case it's a surface. Again, I don't want to sit here and see anybody go pick, pick, pick, on any of this. All you've got to do is hover over it, hit the Tab key, it grabs all the edges all at once. Hopefully you know that trick in Revit with walls.

So you can pick on that. Once I hit Enter, it just immediately then sweeps it all. Again, if I just type in SW, I basically pick on the surface, pick on the profile, hit Enter. Now I got this curvy looking wall system. If I grab SW, again, I can pick on the profile. Now, this is cool. and I'll show you some other tricks with this. I'm picking on the surface and it just knows to loop around this surface. So I'm not actually picking an edge, I'm actually picking on the surface, and it sees the edge on the surface.

So with that trick, this is another one like if you're dealing with parapets. This is a good one to put in your back pocket. If I grab SW, I'm actually picking on the surface, but instead of sitting here and picking the edges, or using the Tab key, just pick on the surface and look what it does. All right? So it just immediately went all the way around and looped on that. All right, pretty cool. Yes? All right. Is everybody alive? All right, just testing you guys.

All right, and then same thing there. I just grabbed SW, picked at the surface, and off to town I

went. So, kind of cool. All right, using the array. Now, a little trick. If you're ever selecting something to convert it to a group, or in this case, I'm going to array it. You have selection windows, of course, you don't have to do that. Just double click and it'll select the whole thing. And then I can right-click on top of it. So when in doubt, right-click. I grab a ray. I feel like I'm in my super duper tricks class.

I grab length between copies. Let's say I want 10 of those, and I pick OK. I snap onto this. The array goes vertically, diagonally, whatever the heck you want to do. So hey, now I've got instant stairs. Now, did you guys see how there's a dash box around that? That's how I know that that's a group. So it just did that automatically for me. I didn't have to do that. It just did it for me, and then if I double click-- so how do you edit the group? Just get on with your life. It's called double click. All right?

I pick on the surface. I can stretch this out. If I need it to be a certain distance I can type that in. If I pick on the edge, let's say I want to grab this edge, and I got to taper it because that would be a lot better if I did that. Do you see how they're all updating? Not too bad. Very quick. That's kind of what I did here with this window detail. This is the same thing. But let's say someone comes back and changes their mind. That will never happen, right?

So I don't want to sit there and watch you guys, oh, I got to zoom in. Pick, hold down the Control key, now go grab the other 35 million of these. All you got to do is hover over it, hit the Tab key. Do you see how? It's really slight. It just picked up on all those surfaces. Now, if I select it, and pick on it, and I can start yanking and pulling. You see how they're all doing it together? So put that one in your back pocket. It's handy at times knowing this little secret of hey, instead of me sitting there picking all those surfaces, let FormIt do that. So it was a nice little added trick that they threw in there.

And then lofting. So this is kind of a base of a high rise I was fooling around with, and so how did I get up with this shape? Well, after working with the design a little bit and dealing with levels, which we haven't talked about, I kind of came up with-- I don't know, you can call it floor plates if you want. But I come in here and I say, well, I want a loft. So I grab this, and all I'm doing is I'm just picking on the individual surfaces, and then I just hit Enter. So it locks that in.

If I go back up, grab loft again, I can then get the other ones. So I'm just picking on the individual surfaces to grab that, and again, I can hit Enter. So that does that. If I go back and I grab loft one more time-- whoops, not groups. But if I come in and grab loft one more time, I'm

going to grab this surface, I'm going to push down, grab that surface. So I grab both of those surfaces and then I hit Enter. So that's how I got that individual. Now, I might have to work on that a little bit. It's a little funky there, but you get the idea.

And then if I want to shell this out, well, my first tool that they gave me was my offset tool. This is the one I've been wanting. So they gave this to me where I can pick on a surface. I can right-click. I grab my offset tool. I love this tool. You think about this. You can use this tool in all kinds of crazy places. But I come in here and I say, hey, I want to do one foot, let's say. All right, so based on that, now I have this other surface. I can pick on this.

Maybe this turns into a parapet, or maybe I reverse it. Maybe I pick on this surface, and maybe I use that trick where I know that I just push all the way down, and now I just basically flush this out, and now I've just got wall systems in here. OK? Not too bad. All right, giving everybody some ideas and some design strategies to kind of look at the different building types you might be working with, and how you can tackle some of that.

The other thing that I want to mention is the shell tool. This is my favorite tool. I come in here and I grab a shell, and I'm going to do negative one foot, and the idea behind the shell tool is if you don't do anything, it's going to empty out the whole entire thing, except for a one foot thickness. Me, I like to know that I did this. So I like to tell FormIt, this surface, delete that surface. So I'm picking one surface, hitting Enter, and now it just shelled out that whole shape. Pretty cool?

So you can do some very organic shapes and it doesn't freak out. The modeler that they are using is a very, very robust modeler, to say the least. So it can handle most things that you throw at it. If you do break it, they want to fix it, trust me. They are very open and wanting to listen to what's going on. All right? Hopefully that gives everybody some ideas. All right, so moving on.

Now, this is kind of leading into the other half of this, and that is I started thinking about facades, especially curved designs. How am I going to break those things down? How am I going to convey design intent that this is some sort of glazing system? How am I going to go about pulling this stuff off and what tool set do I need to bring to the table to be able to pull that off?

So one of the developers basically gave me a tool called facet faces. So I can pick on curve surfaces, and what am I going to do? Right-click. I'm going to grab facet face, and it's basically

going to break that down into individual surfaces. Now, talking to the developer, it's in the works. Basically, me and Josh told the story. I think they're going to give us the ability to do a properties to tell exactly how much control we want over that. So I think that's coming in the pipeline pretty quick.

So that'll be coming, but even with that said, that doesn't mean I can't grab the lines and manipulate and change. It's just, it would be nice if I had the extra properties and would just speed up the process. And then once that breaks down, I can use my magic tab key to grab that edges, and then I can array that up to convey then the vertical breakup of it. OK? And remember, these blue lines are dealing with levels. That's what's going on with that. So just understand this. I have a building, I'm trying to figure out square footage with it.

Now, the big thing. Working with Josh Goldstein on the FormIt team, they flew me down for the Revit technology conference to do a workshop with him on FormIt, and him and I were sitting down and showing them. I was telling them what I'm looking at doing for the AU class, and he's like, you know what? Let me sit down and let's kind of work on some Dynamo scripts to see if we can speed up this process. This is in your class files. So when you guys download my class files and unzip it, these are in there, by the way.

Now, there's a caveat to this. You have to have Dynamo studio to be able to work with these scripts. Not Dynamo that comes with Revit. I'm saying Dynamo studio. If you don't know what that is, look it up. What it is, the difference is this interface. Dynamo studio gives you the ability to control an interface, a UI. So that's the piece that you need. That's why they need Dynamo studio.

So once I bring this script in I can actually have all the control factors. So this is another method. Now, I'm going to show you both ways, but I want to make sure that you guys understand that I'm giving you two scripts that you can break down your facade design if you want to use it through the scripts. OK? So either way, you've got both methodologies to this.

So let me show you both of these. OK? We'll come back to this file. So I'm going to leave this and come back in here to the panelization, and let me grab this guy. All right, so here it is. And the control factor is basically through here. So, Dynamo Studio, basically what you do is you publish the script to the cloud. That supplies a link, and you put that link in, that URL, I and that it shows up over here in your panel. That's basically how the process is.

And then if you want to use this, then basically what you do is you simply pick on it, it takes a

little bit for it to load or run, however you want to put it. So do be patient. And then you just place it. Then from that point, you can move it, you can rotate it, you can do whatever you want. All right, so that's kind of how the process works, and you guys have these scripts. OK?

So if I double click-- this is how you start working with them. If you double click on them, that's how it opens up the interface for you. So I noticed that it's short. So I want to come in here. I want to type in 30 for 30 feet. Again, when I put my cursor-- it's kind of like Revit. Once I put my cursor out under the drawing window, it basically looks and says oh, you made a change to this, and basically updates it. So this has given you some automation process. OK? So if you want to take FormIt up to the next level, this is your process that you can do.

If I want to come in and divide this up even further, maybe I want that to be two feet, not four feet. Again, it's got to go through, it's got to run it. Now you can see how the panels are even tighter. Now that's the animation way that you can do this. OK? There's some stipulations, right? Dynamo Studio. You don't need to know a little bit about Dynamo along with it. Every firm's not going to have that capability, right? Everybody with me on this?

So I know that, and I don't want to leave anybody high and dry. So I basically wanted to go back and say OK, well, going back to my modeling tricks, let's just do it through some right-clicks and how we can do that process. So this is how I pulled this off. So this whole process that you're seeing here, this is how I came about doing this. So it's not overly hard. It's just at times, it gets tedious.

But basically you pick on the surface, you say, hey, I to facet it. You can see how it breaks it up, automatically. The other beauty is, is notice that when I pick on it, it shows me the total square footage. So that's kind of cool. That's giving me some feedback about punched openings and maybe glaze ratio. The other thing is this if I hover over this edge and hit the Tab key, now I can grab all of those edges. I can right-click. I can grab my array tool. I can say, hey, I want to do total length based on, let's say, 10 of these. I can pick a point. Now I array these things vertically.

So now all of a sudden what I have is I have a breakdown of each panel. So you can very quickly-- I mean, that's all about design intent. Everybody's starting to get the idea that yeah, we're going to do some sort of system on here. Now, that doesn't mean that you can't then take each individual line and start massaging it, moving it, doing whatever we need to do to make it further if you want along. Like this example here, maybe I want to come in, grab all of

those edges, select that, and maybe I want to move that down.

Maybe on this top edge, instead of them being equally spaced, I want them to be different. And then I can use my little trick of the Tab key. I can grab all of those surfaces because maybe at the end of the day, what I want to do is I want to push this in. And maybe I want to push that in by a foot. So basically, [INAUDIBLE] that particular. This is really what my design intent was, was this.

So this is giving you ideas of how I breaking this down over here. OK? Does that everybody get some ideas? All right? Breaking this down. All right, so that gives you some ideas of working with some curved surfaces in here, and also dealing with more of an organic shape if you want to go through dealing with a loft surface in here too.

Now levels, you've been kind of seeing that now as we go through here with the different models. You've been looking at the levels as we go through here. You have complete control over this, and by the way, these levels all come into Revit. So again, we're not throwing anything away. And you've got to think about something too, SketchUp doesn't have this mechanism. So in FormIt we basically are-- we do have levels. As it intersects-- and you have control over what it does intersect, and what it doesn't.

So again, if you deal with your levels, like if you have Design A, Design B, you can basically control about which these levels interact with those. But you can see over here, it's adding up the square footage as it's doing this, but it takes a little bit further with this too than as it's doing it. And you can control when you want to see these levels. It's DL to turn them on and off. But the other thing is is that it's giving you a gross area of that, but you can also punch in a target area, and it'll give you feedback where if you're under it or over it. You can even punch in a site area and it'll give you a ratio of where you're at between all of that.

And then the other thing that's really nice too, again, thinking about facade design, is if I hold down the Control key, I can grab more than one surface, and it'll show me what the total square footage is. So as I'm working in FormIt, and I'm working with materials, I can pick the surfaces that are made of glaze, think about what the square footage of that is. I can grab my heard areas, I can grab those, and I can instantly start getting feedback that hey, I've got a glaze ratio of this between those two. All within early schematic design. I'm getting that feedback. All right?

So these are some of the things that I want to make sure you're taking advantage of.

Obviously, we can do site imagery, where you can bring in all of that if you needed to. You also have, of course, sun settings, which you kind of already saw a little bit as I was working with that. And then the other thing, one of the last things here-- finishing this up before I jump back in. Is dealing with scenes.

So scenes, you have the ability to control what you see, what you don't see, camera location, layers, sun and shadows, visual styles, visual environment, and now there's animation between those scenes. So as it jumps from one scene to the next, it'll actually automate an animation between those as you're working with it. In fact, I'll show you a little tips and tricks of doing a sun shadow study using this animation mechanism. OK? This is all can be tools that you could help to show to your clients with your FormIt.

All right, so jumping back into FormIt. So if we go back, and let me just continue on with let's say this Fun Times model. So if I come in and grab site, and everybody's-- this is nothing strange. Everybody's dealt with this, and I'm just typing in our address and our office. And I'm going to import this, and you have control over exactly how much you want to import in from that.

So obviously, this would be something that you do right away instead of what I'm doing now. But then, I can double click on this, I can grab this, maybe move this over to where I want it. Maybe I need to right-click. I want to rotate this Because really, I want to be facing south. All right, so coming in and working with this.

And then the other thing, working with scenes. So maybe I want to come in, control how someone maybe visually sees this. So this is just coming over to scenes, hitting the Plus button. You come down-- maybe this is on the southwest side. You give it a name. It basically remembers everything that you just did. So again, if I rotate it around, if I double click on this, it will basically jump me back to where I was. OK?

You can have as many scenes as you want. As you can tell, you can tell it what to remember and what not to remember. A little tips and tricks, by the way, if you zoom in really close, but then you would like to move your head so you're looking up a little bit, if you hold down the Control key, you can basically-- if you do a control key and a right-click you can actually move your head while you are doing this. All right? So maybe that's going to be another scene. Maybe this is going to be-- I'll add this in. Whoops, and maybe this is dealing with sidewalk.

So, as for the animation, just to show it to you real quick. See how it's sliding back and forth? And you have timing conditions down here. You even have camera speed. So if you're walking three miles an hour, you can actually control it that way. Or if you're doing a drive by, and you're driving by 15 miles an hour, you have control over that too. So you've got some different ways that you could control this.

And if you're doing more of an animated shadow study, how do you pull that off? Well, if you come in here and grab the sun, change it to the time that you're looking at, add another, and say-- I'm just going to say sun one. And down here, and I think I want 10 just so it speeds up for a class. All right, so it remembers this. And then if I come in and change the time again. So it's all the way to the end, and I add another one, and I call that sun two.

And so now-- and just making sure that-- see how it's on, animating as we go through it? And if I just start at the start and hit the Play button, it will literally now start jumping through. Kind of cool. And there's a mechanism where you can turn on the cameras and actually change the camera. Kind of like seeing the camera within Revit, and manipulating and changing it. So kind of cool.

All right, this is relatively new. This is only about a month old. So this is on the latest-- this is version 15, by the way. That's what release number we're on with FormIt. So I always tell people, if you haven't worked with FormIt in the last six months, that's older than dirt. Because this thing updates about every two to three months as we're going through it. OK.

All right, so more to show here. How much time do I got? Still got another 45 minutes? It's at 4:00. Yeah, it's 45 minutes still. OK, scared me there. I've got 15 minutes, really? 12 minutes. All right, so, groups. Now, we saw how when you're doing the array command how groups are automatically happening. Now the biggest thing you have to understand, and this is the biggest picture to understand right here, is this guy.

Components in SketchUp equals groups in FormIt, and groups convert to families. OK? That's the biggest thing you need to be aware of. So looking at this workflow going forward, understand this is the biggest piece of this. OK? Because the whole point that we're looking at is taking FormIt into Revit, right? And I want to make sure that we look at those workflows, especially if the FormIt model changes, how do I get those FormIt changes back into Revit? So we need to make sure that we go through this. OK?

I see the hands raised. Can we hold those until then because I want to make sure I rip through

all of this, and then I'll make sure that we've got five minutes at the end. All right? And I'm going to stick around for however long to walk through. Also, if you work with any groups, you can always make them unique. So if one needs to change, you can do that. It's called select and right-click as you're going through it.

This is the biggest thing you've got to take note. When you're building your groups, your groups can have names. It's going to assume when you build a group that it's a mass category. That's how it's going to come into Revit. But I want you to look at that category list. Casework, entourage, furniture, furniture systems, generic models, and so on.

Now, one of the tricks I learned from Mike last year in his FormIt class was he was drawing some things in FormIt that was very structural like. Well, one of the tricks he showed me was hey, if I bring this across into Revit, I can actually switch the generic model category, if I open up the family, and switch it to structure. So even though it's initially generic, that doesn't mean it's stuck in stone once you get it over in Revit. So put that in your back pocket. OK?

So there's some cool things here. Now, dealing with masses, if you're trying to work with FormIt and Revit, and trying to go from schematic into early design development, obviously, we're kind of dealing more with the massing type concepts. Now those are going to be massing families. Now, keep this in mind. You guys have all updated families in Revit, right? So all those tricks that you guys learned about swapping out types, and all that stuff, is all going to play here within FormIt with its massing families. So there's some really cool things to think about as we're working with your workflows on this.

So the thing is, the process is stupid easy. You basically, in FormIt, you're saving your AXM file. That's the new file format that you've got to understand, is AXM. You basically export that out, or save it, I should say, in Revit then you grab your add-ins. You say, hey, I want to import in that sketch. Understand that if you're dealing with massing, the massive category by default, is always turned off in Revit, so you will need to turn that on, especially when you're getting your elevations and sections, you initially won't see in there. Like where in the hell is my model at? It's because your massing's turned off. OK, so keep that in the back of your mind.

All your location information came across. You don't have to do that again. It all came across. All right? And your groups turned into families, which we already talked about, and all your levels just came across. So think about this as we move forward. I'll show you some other things that we can do with this. OK? But all of that's happening automatically. There's nothing

we can do with this.

Now, the other thing is-- has anybody ever worked with the massing tools in Revit? Are they fun, and glorious, and super easy?

AUDIENCE: Woohoo!

JAROD SCHULTZ: Yeah, exactly. That's why you show it to a SketchUp user and they're like, what? Get the hell-- get outta here, man! Go away. It's never very push-pull. It's not friendly, hence FormIt. But one thing that came out of that whole grand thing is we can slap building elements onto the surfaces. Right? Has anybody ever played this game? Well, this game is still alive and well. So we're not re-learning anything. A lot of you have already learned this process. We're building upon it. That's all we're doing. OK?

So we've got curtain systems, roofs, walls, and floors that are going to slap onto that model that's coming in from FormIt, and off you go. One of the little tricks to put in your back pocket again. If you simply draw a rectangle, or whatever the shape is, on a surface in FormIt, that surface is being shown or being illuminated with these tools. So even though I didn't press this in or anything, Revit still picks up on it, and I can take it and put it as a curtain system.

So that's kind of a cool little trick. So if you've got punched openings, but you don't really want to recess it or anything, you don't have to do anything. Just leave it as a surface on there, and off you go with it. So let's look at this and build upon this process. So we will continue on with this model, here. So no smoke and mirror. That's not what I do in my classes. So we're just going to run with this Fun Times model that we've got.

So I'm going to save this. Now we're going into Revit. We'll come back to that model. So let me just start up a new-- now, this is something that I think as more of my clients-- I'm trying to get my clients onto this stuff. I'll have to think about this. I'm hesitating if I want another separate template, or if I go back to my original template and just enhance it more. So, I don't know how you guys feel about how much you want to load into your template. Me, load it up. It's faster to delete than trying to find stuff and load it in, but not everybody's into that mode.

I don't know. That's something to think about, OK? So as you look at the back end of this class, it might make you think like me going, do I want a another template with this? So all I'm doing is-- I like to do it in a 3D view, to be honest, and then I just go to add-ins. I say, hey, I want to bring in a FormIt model. Basically, I'm going to grab that Fun Times model that we've

been working on. Give it a few seconds. You'll definitely have to do a zoom extents, by the way, once it gets in here. And then there it is. OK.

Now, if I go into it myself self elevation-- all right, now that's interesting. Where's all my other levels? Oh, you know why, because Jared didn't build any levels, did he?

AUDIENCE: Nope.

JAROD SCHULTZ: You guys didn't see that.

[LAUGHTER]

So just look away from the screen for a second.

[CHUCKLES]

So I'm going to come in. I'm going to say, hey, I want to build six levels. I can't believe I space that out. That's funny. All right, so there's my levels. Let's double click on that and I'll go into write properties. I say, hey, I want to use my levels. Yeah, I totally spaced this out. You guys, sorry about that. So I'm seeing all the areas of it. Right? That's cool. Then I can come in, I can set up a target area. Maybe I was supposed to be doing 20,000. I'm over that. I can do a site area. I can get in a ratio out of it.

Now if I go in and I save my local file, now I've got levels in it, and now magic will happen. So now if I come back, grab projects, say hey, I want to do the architectural template. That's funny. And I'll go to a 3D view. Close down that. Add-ins, I want to import in my Fun Times model, now that actually has levels to it.

AUDIENCE: It's not a link, right?

JAROD SCHULTZ: No, but I've got to be watchful. I work with the FormIt team, and the Inside 360 team, and there's a small team on the Revit side that I'm working with. Magic will be happening. I'll just leave it at that. There's some cool things. I can tell you this, in the next version of the add-ins, materials will come in from FormIt. Right now the materials don't come across. The next version they add-ins, the materials will come across and that's a huge one.

All right, so--

AUDIENCE: [INAUDIBLE]

JAROD SCHULTZ: No, literally when the FormIt model comes in, the materials get dropped off. But in the next version of the add-in, that should be hopefully soon. I was hoping it was going to be here so I could show it off. The materials will come across. That opens up rendering, VR, all the big pieces. OK, so, that's a huge one. So that will be coming in really quick, probably in the next 30 to 45 days.

All right, so now I've got levels. So now if I go to south, but I can't see my model. So just remember, VV or VG, however you do it, and I just turn on my mass. All right, so there's my mass. Obviously, being anal, I've got to get the levels to be all special. Whatever, you guys know the gig, right? But the levels are there.

If I go back to my 3D view, if I pick on my mass, mass floors, yes, I want mass floors. I pick OK. Now it's actually sliced up the model. I can come over here to the massing, say hey, I want to do floors. I can come in and start now picking on those. I can say hey, create all those floors. Now I've got floors in here. I can come in and grab curtain systems, and say hey, that's a curtain system, that's a curtain system, that's a current system. I'm going to create my system. I want to start throwing in some walls. So I can start throwing in my walls. You guys get the gig, right? But that's how quick it is and how fast it is.

So again, we're not, in essence, at the end of the day throwing anything around or throwing anything off. I can throw in my roof. All right, so start working out the model. OK. So that kind of gives you some hindsight about going further-- taking it from FormIt into Revit and building upon this. Now, this is going to happen. Right? Someone goes back to FormIt, decides no, it would be really cool if we did this.

Now, how am I going to get that piece, that change, over back over into my Revit model? So they go back in-- now understand, if I jump back here to Revit, understand that-- and let me open up another model here, to give you guys some hindsight about what's going on with this. So if I go back into my groups.

Let's say this is the original change. Now understand what's going on here, if I pick on this, understand that this is a group. It's called Unit B. I have multiple versions of this sitting over here. In fact, there's a group tree now in the new version, where when I pick on this, you can see how it's highlighting the group. So this is wonderful. This is new in the last month or so, this group tree.

So you can see that we've got multiple versions of Unit A and Unit B. Now, let's say someone

goes in there and they make a change. Now, I'm not going to sit there and sit down build the change. So I'm just going to do it real quick. Let's say they put this notch in here, and you can see how it's changed in some of the other ones. Right? So if I rotate that around, you can see the notch. But this lives in Revit already.

Let me go in and open, actually, the Revit file. So if I come in and grab-- whoops. If I come in and grab this, and open up-- and you guys know how this FormIt model got over here. It was just imported in. But understand that these are families. So if I pick on it, it's a massing family and it comes in with the names.

So this is something else that you guys got to think about is as for a design strategy, is when you start looking at your FormIt models and you start grouping them, you'll need to start thinking about some naming conventions as you're doing that. So you have some control over it. So people kind of understand what is what once it comes over into Revit, especially if a design has changed. So basically if a design has changed, and this thing is already in Revit. We've already kind of moved forward. We're starting to build our cartoon set. How do I just bring across one piece?

Well, what you do is you simply select that group and you come over here to export. You say, I want to export this locally, and what you do is you say, hey, I just want you to export out what I have selected. And then what it does is it creates another AXM file. Again, giving in a name, knowing what that is. So that's the Unit B. This is the change that I'm doing.

Once I've made that once, I've exported that out, then what we're doing is we're going back over to Revit and all we're doing is going back into add-ins and saying, hey, I want to import that change. So I grab that AXM file that has the change. What's awesome is that if I make the change exactly where it was, it lands exactly the original was. So that's kind of cool. But if I move them away, you can kind of see what the differences are.

Now, you guys know this trick. If I know that hey, all the Unit B's need to be updated, how am I going to make that a change? That's a family, right? So all I'm going to do a select one of them, right-click. Say hey, select all instances in my entire project. Goes out and selects them all, and then what am I going to do? I'm going to go over here and say, oh no, that's supposed to be this new version of B 1, and guess what? Now they're just updated. All right?

Now in the future, is this workflow going to tighten up? Is it going to be more linked? Yes.

That's the road plan, but is that disastrous? Is that hard? No, that's just a few picks and clicks, and you just kind of manage it a little bit with some naming convention. So we're not throwing any of that stuff away.

AUDIENCE: The layer for your attached walls are [INAUDIBLE] stay attached if you're swapping them out like that--

JAROD SCHULTZ: It depends on how bad the surface change is. That's what it comes down to. If it's not that bad of a change, you can pick on the building element and then say, update towards surface, or face, or whatever it is, and it'll update. If it's a pretty radical change, yes, you might have to grab the building elements, delete them, grab the wall by face, or whatever, and go ding, ding, ding, again. At the end of the day, I'd rather do that any day than just basically take a SketchUp model and throw it the trash can. Or try to bury it into a family and bring it across as a family.

All right? So exactly. That just gives me the willies. But this is much cleaner, to say the least. It's talking Revit. All right, so everybody get the idea of that workflow? This is all in your document. You guys got the files to play around with if you needed to. So that's just the process. You got the old, you got the new. You basically save it out as its own separate AXM file. You bring it and, you can grab that family type, select it, and make a quick change. And then if you want, you can update the face if it's not too radical. If it's really radical, then yeah, you'll have to blow out the building elements and put them back on. But either way, I can live with it.

The other thing I want to throw out there, with that workflow, I want you to sit back and think about. something. I just showed you groups, groups turn into families. It can be a generic model. You guys ever dealt with where someone in SketchUp did this really cool facade piece, and the Revit people are sitting there going, how in the hell are we going to model that over there? Has anybody ever been in that want? Well, we don't have to. Right? Hey, how am I going to build that? That just went right out the door. Now it's a generic model family. It came right across. You can cut sections through it. Your elevations are there. Everybody see the light bulbs clicking? Yeah, this is why I'm all excited. I'm like, will someone join me, please? Can I work with your firm and help you do this because man, this is cool. All right, so, sorry. Got excited there.

OK, so looking at this big picture then, let's think about Insight 360. Now, Kimberley's doing a

class, I think it's tomorrow, and she's going deep dive in showing her firm and how they're dealing with Insight 360 and FormIt. I want to give you at least the idea the taste of what's going on, more from a facade standpoint. So Insight to 360, or FormIt to Insight 360, again, this is just generate insight. It basically takes the FormIt model, takes it up to the cloud, burns and turns on it, and then basically from there you can start working with it.

Now, I'm just curious. Anybody work with Insight 360 yet? Very few. This is all I'm running into. Start looking at it. I work with Ian and Stephanie on some of this, and they're the ones that are kind of taking charge of the Insight 360 from Autodesk, and it's very, very cool. The other thing is solar analysis. A lot of you have been doing this forever, and understand what's going to be hot and what's going be cold.

But you're talking to your stakeholder. Your stakeholder doesn't know this. He or she would love to see a visual from you guys. That's what, really, I think the solar analysis gives you, is a pretty picture to show hey, if we rotate this, this is why I want you to rotate the building on the site. So that gives you that ability. OK?

Feedback on the facade. Now, when you load this directly from FormIt into Insight, it will make some summations of how it's going to break apart those surfaces for glaze ratios. Now you have control over this on Insight 360 to an extent. Ian an I have been kind of beaten up on the FormIt team a little bit about giving us more control, giving us some sort of mechanism in FormIt saying that's glazed. Something through the properties or something. So I think we'll get there, it's just going to take a little bit.

But that's all right, I've got a workflow to get around it. OK. But even with that said though, when you go from FormIt to Insight 360, you do have the control over glazing. They're called scenarios. So when you first load this into Insight 360, build a scenario, call it default, or starting, or something. OK? That's your ground point. Then from there as you change these tiles, and say hey, on the south walls, what would this look like if I changed it from whatever the default was to 40%?

What type of energy costs are we changing here? What kind of feedback am I getting off of this? And that's what you're going to do. It's going to give you that feedback, and it's based on ASHRAE and 2030 setting, so I'll show you this. But this is kind of what the tile looks like. So as you make a change, it's a slider basically, you can see how this is affecting, and what might work or what might not work as you're going through it. But you definitely need to title your

scenarios as you're doing this. So just a heads up.

Now, if you take a couple extra clicks and bring the model over into Revit, there's a plug-in for Revit for the Insight 360 that gives you tools. Same types of tools. In fact, it gives you a few more tools to be honest, but obviously, it's grabbing the location. But you've got your energy settings that you can basically work with a little bit more. It creates an energy model, which we'll go through these steps. And when it creates this energy model, it also gives you schedules. I don't build these schedules. This is built into the toolset.

So I want you to stop and look at that schedule. It's telling you the square footage of the exterior wall. So it's doing this automatically. I'm not having to build it, but one of the tricks that Ian showed me was, Jarod, if you go back and delete the energy model-- so there's no update. It's called delete the energy model.

But if I go back in and slap curtain systems onto where I'm proposing the glaze to be, and then create the energy model again, notice what it did to the schedule. Now I'm seeing that I've got about 2,500 square footage of glaze on this. So I'm getting some feedback now, of this. The bonus is is that when I shove this up into Insight 360. Shove it-- I shouldn't.

[LAUGHTER]

When I take it up to Insight 360 it actually picks up on it. So now I'm getting real detailed feedback of what's going on with this, and what's working and what's not working. So a few extra clicks, I'm getting a little bit more detail out of it. Along with the Insight 360 add-on, you're also getting lighting analysis. This is huge. There's schedules that come with this too. Now, this is dealing with your cloud rendering, so this is going to take a couple of Cloud Credits. So just a heads up.

Anybody deal with cloud rendering? Same type of scenario. OK? But what's cool is is that imagery comes back into your Revit model, and you can use that, and it gives you graphs, it gives you schedules. And you also have a solar analysis, kind of like what I showed you within FormIt. So they're giving you some other additional tools within Revit. So it's kind of going more from raw schematic, more into early design development. You can flesh it out a little bit further.

The point here that they're trying to make with Insight 360 is, as that model continues to get more detail, you can continuously shove this back into Insight 360 and keep getting

information back out of it. So you can make those early design changes when it's cheap and doable. Not halfway down the road and then you pray that you're going to get the rating. So hopefully, this gives you guys some hindsight about what you can do with some of this.

So looking at this and the massing-- actually let me jump into my Insight 360. So looking at my model and working with this-- in fact, let me go back into FormIt for a second. Let me open up a different model, and let me open up-- so this is kind of the bigger picture. You saw the base that I was working with, but this is kind of the bigger model that I was fooling around with. And then this is just to kind of give you-- that's the lofted plates that I was doing to build this shape. So just doing some layers in here to get things across.

But I threw this up into Insight 360 to start looking at what type of feedback I'm getting. So this is the one that's dealing with, and coming directly from FormIt. So looking at this, a couple of things. Understand that you're getting a value. There's settings on this, on looking at this. You can see that your model, and how it's breaking up that glazing type with the ratio. Also, I want to make sure you guys understand this is dealing with ASHRAE as a standard, along with the Architecture 2030 initiative. So this is giving you good feedback on this.

And then if I go down a little bit further, this is where I was talking about the window-wall ration, and this is where I can pick on the tile. I can pick on this. I can change the graph and look at the sliders, and change this, and start getting feedback about what's going on with this. Again, if you want to save this, this is where you'd save it back to a scenario. So you can kind of go back through the scenarios to see what changes that you did as you walk through this to get to that number. OK?

So that's kind of showing you some ideas of going directly from FormIt over into Insight 360. Now, if I jump back into Revit, and I close this down, and get back to this model. So this is a model that we went a little bit further with, and in here-- now I did the glass and the curtain wall system, and you can see over here we've got analytical surfaces. So this is where you're getting that information back. And again, this is not a schedule I created. Insight 360 did it automatically for me.

So the other things that's going on with this too is you can see the energy model, and this is just basically a button over here. There's just a button called Delete and Create. So if I did go back, there was more edges that I was going to go ahead and put glaze on. Just understand that I would simply delete the energy model, and then come back and say hey, recreate that.

And that's all that's going on. It's just a couple of clicks, and to create the energy model just takes a few seconds for it to go through and build it.

Now, along with this, if you take it into Revit, going a little bit further, this is an example of using the lighting analysis tools, and getting that information back out. This lives within Revit model. And then the other one I showed you, this is one that's in FormIt, but you can also do it within Revit also. So I want to educate you guys a little bit more about what's going on with Insight 360, but like Kimberley's class is going to be going a little bit more detail about what's going on, and how their firm is doing it.

But I wanted to at least give you guys some education about what's going on with it so you guys can start looking at what this could maybe do for your firm, and how FormIt, and FormIt and Revit can interact with that model, and what you guys need to know about how to do that workflow. I don't think any day is hard in any way. It's just a few picks and clicks, and you're starting to get this data out of it. OK?

So moving on. The other thing that's kind of cool, shading device design. So thinking of this. That's something to ponder on too. All right, so these are some examples from actual firms that have done this, and using those tools to get that feedback. Some of the last things I want to mention is Revit to FormIt. So one of the other questions that I get asked is, is there capabilities of taking information that I've done in Revit, or maybe one of my Revit people did, and can I take that and bring that back in my FormIt model? The answer is a big fat yes.

So one example that I throw out here is like floors. If I'm doing a high rise like this, I'm not saying that I can't sit there and build all the floor plates of this. If I wanted to model that in FormIt, that's definitely doable. It's just going to be tedious is all it's going to be. Now, how hard was it for me to build the floors in Revit? Pretty fast, wasn't it?

So the idea, the concept that I will throw at you guys is I could very quickly take the FormIt model into Revit, slice and dice it, tell it to build the floors, turn everything off except for the floors, and export that out as an SAT file. That's how you pull it off. Once I then do that, I can go back into FormIt, and guess what? I can import the 3D model, SAT wise, and off it comes in.

So the thing I want to throw out here, one of the last things I want to mention is is that these are the other things that you guys can pull off. Let me go back in and let me grab this. And this kind of shows you the bigger picture of how far-- I wanted to go further with this model but I

ran out of time. I don't know if anybody saw the revisions I was doing on my documents, but I was like on revision four of my document, revision two of my files. So I'm like OK, done. Quit playing.

So I myself, was geeking out, but this gives you an example of taking the FormIt model in here, bringing it out. You can see how the floors are in there, and that's all I did. So just giving me an example, going back into FormIt, I personally didn't want to sit there and build all those floors. I'm like, that would be stupid. So I just went in, threw it into Revit, and then brought it back. So all I did was in Revit is I turned everything off, except for the floors, and I don't know if anybody's ever done this, but it's under CAD. It's just SAT. That's all it is.

So you basically turn everything off from the view, only of what you want to bring back into FormIt. That's all you've got to do. Shove it out as SAT, go back into FormIt, import it as SAT, done. And it lands exactly where it was before. Nobody moves this around. Everything all bi-directional. It works.

And then the other thing with the current system. I showed you design intent on how you could go to the n-th degree, but that's the other thing. You could come in, lay out all the curtain systems, and then throw that back into FormIt if you want. So how does that look, or how does that work? All it is, is coming back into FormIt, and all you're doing is coming up to import, saying import 3D model, changing this to SAT, and let's do the curtain wall system. Now, this is going to take a little bit. So this is going to take-- I don't know, 10 seconds, that's forever, right? But there's a lot of faces going on.

My only complaint right now with FormIt is with shadows. They need to work on the performance a little bit more with the shadows. But that comes in as a group, by the way. All right, so there's that curtain wall system from Revit, now in FormIt. So you can go both ways. This is something that people have been asking, and they've been working on this. So kind of cool. All right.

All right, so that gives you the idea, just taking it in, slicing and dicing it, and then coming back, exporting it out as SAT, and then importing it back into FormIt, and there's my floors, or hey, there's my curtain wall. And I get this ask all the time. Can you do 3D terrain in FormIt? The base engine currently right now is flat. You saw that, but it lives and breathes SketchUp files, right? So if I go into SketchUp, do the little magic over there, save it as a SketchUp file, import 3D model. Boom, it's in.

Just to show you real quick. Nobody believes me at this point. So, I hope you enjoy the humor. I try to have fun. SketchUp, and if I actually grab the SketchUp file, not SAT. Come on, SketchUp. Sure, Jarod. See? I'm lying. Wow. I've never seen it take this long. Usually, this is blink and there it is. So I don't know if it's the curtain wall system or what's all going on, but you'd import that thing in. Maybe I shouldn't have done it with the current wall system in here. Or maybe this is how you crash FormIt. There it goes.

So there you got your 3D train. Why it's not showing, it's just my display. I'm doing monochrome is what I'm doing. All right, so you can bring 3D train into this. It's just do a SketchUp file, and off you go. And you can even build hot rods in FormIt.

So my Buddy Ryan Cameron, this is a couple months back. I've got a 32 Coupe, so I don't know what made him one night sit down with FormIt and build this, but he built that in FormIt, which is ridiculous. OK? All right. Did I feed you enough?

AUDIENCE: Yeah.

JAROD SCHULTZ: All right. Questions?

AUDIENCE: Yeah. Well, obviously, I have a whole company full of SketchUp users, and in your experience, what kind of-- and I, myself, have always tried to learn SketchUp, but it's so comfortable with Revit for 15 years that I've just never bothered. So, if I were to try to instill this workflow in my office, what kind of hurdles, what kind of push-back am I going to get from my SketchUp users? Well, it can't do this, or it can't do that. In general, what can I prepare myself for?

JAROD SCHULTZ: Well, I think the biggest thing that needs to be brought up is I'm not taking your SketchUp away. If you want to still use SketchUp, and there's still things that you might do in SketchUp that are faster, that's OK. Do it in SketchUp. The point that we're trying to get at in our firm is we're tired of this throw away. So what I can do is take your SketchUp and I can bring it into FormIt, and then I can bring it into Revit. And maybe that's just the first concept to them, and giving them the idea that that's a possible solution now.

So now they're not getting beat up anymore, oh, your model's a throw away. Or hey, you're starting to fool around with the FormIt stuff, and you're starting to understand area analysis and things like that, because they'll probably dig that because that's not in SketchUp. But then they want to go over to SketchUp because they're faster at doing this one facade piece, that's fine. Do that, and then save that as a SketchUp file, and then we can just bring that into

FormIt, and then we can place it where it needs to be placed.

So I think really, the point that you have to do is don't scare the bejesus out of them. Don't say, oh, I'm taking your SketchUp away. Hey, let's look at FormIt, and let's see how we can do a blended solution today. And by the way, we can take all your entourage and you can use it still. OK? So don't scare them, I guess, is at the end of the day. Don't scare them.

AUDIENCE: Well, it's the main reason I'm here in this class because exactly this is what the upper level have said where we're tired of wasting, and regurgitating, and spending a lot of time rebuilding models. It's the main reason I'm here. So, like I said, to completely jump to another piece of software--

JAROD SCHULTZ: It's a big leap and it's a gigantic workflow change for your firm.

AUDIENCE: And you said there are some key features that you can do in SketchUp that are still not there--

JAROD SCHULTZ: The big stuff is they areas, the levels.

AUDIENCE: Which FormIt can do, but not SketchUp. But what about the other way around? What are people's [INAUDIBLE] main tools they're going to miss if they--

JAROD SCHULTZ: One is copy edge. I ran into that with RNL design. One of the larger firms in Denver, one of the principals was like, where's this? I'm like, OK, it doesn't exactly do that. You can use your array. But they're aware of it, and FormIt's at this point where they're listening to the SketchUp users and going oh, copy edge? Well, we can do that. That can be on the next version. That's not hard to do, and that's what they're doing now.

They finally got layers, right? They finally got layers, and scenes, and material. They finally got all those base pieces all laid out now. Now it's just going back and saying, oh, you need that little tool? Oh, we can do that. So yeah, copy edge is probably one of them. What's up?

AUDIENCE: So [INAUDIBLE] seems to be a lot of fixture modeling happens in SketchUp. So I'm wondering if once you bring in either from SketchUp and FormIt or FormIt and Revit, and becomes a family, are you able to then edit that family in Revit? Or is it still like a locked box [INAUDIBLE]

JAROD SCHULTZ: Currently in it's state, the answer is no. You can work with it, you can change it, you can modify it. Now, I don't know. There's some things that they ran into with the material conversion that they're working on, where they're changing the engine just a little bit on the

back end. It'll still be a family, it's just you might not have as much control as you have today. And it's just a little bump in the glitch that they ran into. Now, they're thinking maybe later on down the road they can get past it, but just a heads up. But it is a family, you can still do some things to it.

AUDIENCE: You can still apply [INAUDIBLE]

JAROD SCHULTZ: Yeah, I always just give people a warning. I don't know how much further you'll have some of that. It might disappear a little bit in the next few months, but it'll probably come back. There's just a challenge on the back engine.

AUDIENCE: So you can monitor your floor areas. Is there anyway to start some monitor individual program areas or compartments?

JAROD SCHULTZ: Dealing with groups and layers, you can start playing that game.

AUDIENCE: And then my second question is there any building functionality for design options? Or is that also--

JAROD SCHULTZ: That's groups, groups, and scenes, and layers. Yeah, I should pull up, to be-- Josh did a design study of a school down off of Broadway in Hampton, and he literally did scenes and layers, and literally went from a massing scenario, into an actual full fledged design. So doing exactly that. So it's definitely doable.

AUDIENCE: For location mapping between FormIt and Revit, Revit has the origin, the survey point, and the project base point. How is FormIt thinking about location? Is it just using one of those to align Revit? Or does it have all that stuff going on in the background?

JAROD SCHULTZ: No, it's not. If you pull it up and look at that, it's just that location points kind of a separate little engine, to be honest. So thinking of survey and all that stuff, you're still going to have to do the business of working with the survey point, and so on. It's not playing with that.

AUDIENCE: [INAUDIBLE] mapping to one of those, like a project base point? [INAUDIBLE]

JAROD SCHULTZ: Yeah. You'll still have to micromanage that, like we all know, which is ugly. Anything else?

AUDIENCE: When you're talking about importing Revit families that you get all the [INAUDIBLE]

JAROD SCHULTZ: I have to look at that. I can't remember if it looks at the catalog. I don't think it does. Tobias is

shaking his head, no. No. Baked in only.

AUDIENCE: So then what you can do is you can bring in the ones you want into Revit--

JAROD SCHULTZ: You could do that.

AUDIENCE: Then take that, and bring it into [INAUDIBLE]

JAROD SCHULTZ: So favorite types. So you hold down the Control key, ding, ding, ding, now build that, and then say, OK, now convert that one. So you could do that game. Anything else?

AUDIENCE: When you import the FormIt [INAUDIBLE] family environment, can you begin adding grandparents and types?

JAROD SCHULTZ: That's the same question the lady before asked. When that thing gets converted into a family into Revit. Can you do it? Today you can, I just don't know how much longer you'll have complete control like you have right now. They're changing that a little bit just to get through this hiccup with the materials. So just a heads up. Correct, Tobias? Is that the correct way of saying it? I hope so.

AUDIENCE: [INAUDIBLE] going to come in and [INAUDIBLE] imported objects, and you can embed other informational parameters, but you won't be able to adjust the geometry [INAUDIBLE] geometry instance [INAUDIBLE] maybe want to update that [INAUDIBLE]

JAROD SCHULTZ: So FormIt basically owns it. If you want to change it, go back to FormIt.

AUDIENCE: Got one more for you, so for using some of the sun studies, when you can select the satellite image, is that what it's georeferencing?

JAROD SCHULTZ: Yeah, it's looking at that location. It's just like the same location mechanism inside Revit. Same concept, same idea.

AUDIENCE: My SketchUp users like the fact that they can kind of sketch all the surrounding backgrounds and SketchUp will place that jpeg on the surfaces. Is there anything comparable like that?

JAROD SCHULTZ: They're working with-- I don't know if you've looked at Flux. So that's--