

**TONY** Good morning, everybody. Welcome to Autodesk University 2016. My name's Tony, this is my  
**CRAWFORD:** coworker Brian. This morning we're going-- what are we doing? Zero to CD in 90 minutes.  
[LAUGHS] This is going to be fun.

**BRIAN JUGE:** Yeah.

**TONY** This is going to go pretty fast. So this morning we're going to be demonstrating that by utilizing  
**CRAWFORD:** the tools that are already built into Revit, that you can create a document in less time than you probably could before. In short, we've put a lot of time into developing our Revit project templates. In this session we're actually going to demonstrate the results of all the time-- that you can now save a lot of time, we can save a lot of time because we've set it up. If you set up your template you can save a lot of time on all your future projects.

This will be a slightly abridged version of a standard project. To create this in 90 minutes right before your eyes live, we are going to be working fast. We're going to be pointing out as many tips and tricks as we can and explaining tools that can save you time along the way. Please feel free to take notes of anything that might be beneficial to you. Not everything that we cover will apply to everybody here. And also, to do this while you wait, we're going to have to make-- we made a few assumptions-- like work sets are great tools. We're not going to be using those. Just to save a couple of minutes there. Shared coordinates, also great. We're not going to be doing any short coordinates.

And a few other things, like, for example, this is not going to be a 2 million square foot university teaching hospital. It's just not. It's going to be a very simple retail. A legitimate building, but a very simple example because you don't want to watch us work for four hours. We're going to focus on-- well we're going to focus on the design because so many other things are already done. Let's see. And I would say that we're going to start with a blank file, each of us will start with a blank file, but not an empty file, and that's kind of the important part.

So at the end of the session, we will have-- hope to have-- construction documents, that's the plan. We'll see what we get. It's not going to be 100% as bid, ready to build, deliverable, but it will be a set of documents with plans, and schedules, and elevations, and details, panel schedules, you've got wall details, enlarged views. It will be a set of documents.

So, if this isn't the class you were expecting, this is a good time to pretend like you need to

take a phone call and step out. I'd rather have you take advantage of that now than halfway through the session. That's OK. If you signed up for this class two months ago, this is-- sometimes it happens.

**BRIAN JUGE:** Yeah, personally we were shocked that this class sold out in about the first week, that everybody wanted to come and watch us do a demo. There is going to be some meat in there. We will be talking over it, trying to explain some stuff going on.

**TONY CRAWFORD:** All right. So at the end of this session, you'll be able to learn how to create a template that does more routine tasks for you, learn how to engage the BIM process more than you have before. If you have the app, you or on the web site, you can download the slides as well as the handout. The handout goes into the BIM process-- or the engagement-- just a tiny bit more. It looks at a survey. You'll know how to reduce billable time that you spend on repeatable task. Why spend time on repeating yourself? And also learn how to focus on the design, rather than all the tedious tasks in the software that you do over and over.

My name is Tony. My degree is mechanical engineer. I do a lot of-- I've done a lot of stuff. At one point I had truck driver on the slides because I've done that. I do a lot of Revit teaching for the MEP industry and a lot, comparatively, a lot of Navisworks. There's only one, I think, last time I checked, I think there's two others that teach more Revit MEP, and maybe a couple others in North America, US and Canada, that teach more Navisworks than I do. And I pretend to tell my boss I'm an engineer and that I know Revit.

**BRIAN JUGE:** My name is Brian Juge. I've been practicing for over 20 years, licensed in California and Colorado. I have my own private practice outside of my own standard job at CAD-1. I also am the co-host for Revit Radio. Some of you might have heard of that, where it's basically car talk, live, fire us questions and we answer it live in there, and I'm also a father of four. If that isn't enough. CAD-1 itself, founded by Structural Engineer 27 years ago, located in Denver. We're a Autodesk Resailer training facility in there. Teach a lot of Bluebeam, a lot of other stuff, but mainly we have a lot of professionals on staff.

Our approach is how would we do it as a designer, as an architect, an engineer, rather than what does the software do? We are not slaves of the software. We make the software slaves to us. That's kind of the approach in there. And we've been working with quite a few different companies throughout the world, so here's just a couple of them out there that we've been working with. All right.

**TONY** I was going to ask just a couple of quick questions on Revit experience. How many here, just  
**CRAWFORD:** raise of hands, have used Revit for a year, or maybe less, one or two projects or less? OK.  
How many have used it for two or three or four projects, maybe a couple of years? You don't  
hate it as much, but you're still-- [LAUGHS] How about several projects, you've got the hang of  
it, you're kind of intermediate, advanced? OK. [LAUGHS]

**BRIAN JUGE:** How many are advanced? OK.

**TONY** OK.

**CRAWFORD:**

**BRIAN JUGE:** This is going to be a low-level presentation, just let you know. Just going over what templates  
they are and how to do that.

**TONY** Yeah, we're not going to dive super deep, and this is not going to be teaching you every single  
**CRAWFORD:** tool that we use because I think I could spend a day or two showing you everything that we do.  
And Brian could probably spend another day or two or three going through everything.

So, the meat of the project. This is kind of the point in the next few slides. How can you save  
yourself time? If you save time, you save money. Basically, anything that you might repeat in a  
project. Almost anything can be added to your template. Do you always have sheets in your  
project? Of course you do. Put them in your template. Are they typically numbered the same?  
Put them in your template. Do you always have a luminaires schedule, door schedule, notes?  
Any schedules you set it up once, put it in your template, then as soon as you get the next  
project, click start, new file, your schedule is done. If you always have notes, well, you'll have  
to tweak them, but you have a place to start.

No, sorry.

**BRIAN JUGE:** Sorry, it's me.

**TONY** So just curious, how many people have seen this slide before? OK. It's been around a while.

**CRAWFORD:** For those of you that haven't, the background-- 1 and 2 are kind of the background to that.  
Any-- what's it say again? I'm sorry. The ability to impact cost and performance. Slide number  
one. The beginning of a project. You just got the project and the client says, I want a two-story  
building-- no, wait, I want a three-story building. OK, you can accommodate that change. Or I  
want CFL lights-- no, wait, I want LED lights. You can accommodate that change pretty easily

at the beginning. As the process goes along it gets harder to accommodate those changes. Likewise, number two, the later you make changes, change your mind, it gets more expensive. So that's the background. You want to make any changes, change your mind, a client changes their mind, you want to do that-- earlier is better. OK.

So in the black, number three. Would you say that the time spent on construction documents is most of the hours during the CD phase? I know it varies a little bit, but most of the bulk of the time is during the CD phase. Line number four. The BIM workflow. BIM Revit generally tries to shift that curve forward. Maybe spend the same amount of time, maybe a little more, maybe a little less, depends on a lot of things, but that time is spent earlier, when it's cheaper and easier to accommodate changes.

So if you can shift that curve sooner, and maybe you might even be able to spend a little less time. Not on your first project, not on your second project, but if you shift the curve later it's easier and cheaper to accommodate changes. And ideally, if you have a good template, a lot of things fall in place. I know, once you get the hang of it, not your first Revit project, once you get the hang of it, you'll spend more time early on in the SD phase. And then you get to spend-- maybe you spend more time early up front setting things up, but then things just kind of fall into place. And really where we're going to be focusing today is the done once, used on all projects. We've spent a lot of time working on our templates. In this earlier parts. Done once, used on all templates.

So, like I said, if there's a lot of things that are repeated, if you do them once ahead of time, before you even get the project, that can save you some time.

**BRIAN JUGE:**

All right. So next part, template, make a plan. This starts before you even get into Revit. You've got to have that plan in there. How are your office standards going to be? What are your naming conventions going to be? Put that together. Make a list. Without that, you're going to fail, hands down. The views. Now's your time to change them. When I get to views, I'm not talking about specifically views in Revit. I'm like how do you want it to look? A lot of times we did this conforming that we did for a CAD. Our CAD drawings used to look really nice when we did them by hand, and then we had to conform them to the CAD standards. Now's your chance to go in and change those standards up. Take a look at what you're doing. Take a look at the quality of work. Make those decisions there. Don't do it-- well, we've always done it this way because CAD did it. Don't force yourself to do it to CAD. Why? We've got Revit now. We can do other things.

The other thing, and this is probably the killer, start anywhere. I cannot stress that enough. I go to far too many offices and what do they do? It's the old, I'm just going to start with the last project and kind of keep going, or I'm kind of piece-mealing it together. Just start anywhere. Good place to start, your last project. Just get through a project. Do it. Do one, do two, do three. I'll show you how to go-- you can compile those together.

All right, now, when I go to start a project, first thing I'll do, I'll take that out-of-the-box template if you've never done it before, and start defining the origin point. How many people know what the project base point is? OK, every hand should go up. That should be defined first stop. You don't define that at the beginning of the project, it's going to hose you later on. OK? Or especially when you get to coordination, you get to larger projects, you've got to have that in there. I usually put grids and reference planes in there. You can see I've got an elevation point letting me know where that point is at all times. I use reference points and grids at that point.

I do a lot of residential design. Residential designers, we're notorious for not using grids, but they're in all my projects. OK. I've been using those for years. Set up your heights, things like that. Architects like to be 100 feet, so their basements are positive numbers, things like that. That's my prerogative. I'll do that. OK? I know some people are like, why would you do that? Because I'm an architect. I can. All? Right

Set up your true north, things like that, because right away the client's going to ask, well that's not how my house looks on the site, and you're like, fine. Just make it work. Set up your units, those types of things in there. And by setting up the units, I should go back and say, if you're going to be doing brick coursing, set up eight inches. Have a half of course. Prepare yourself ahead of time. If you're doing large scale refrigeration plants and your structural base 30 feet, put 30 feet in there. Make the software work to yourself.

Then get in the annotation. This is the tedious part. Get in there the tags, the symbols, the textiles, dimension styles, legends, put all that stuff together. That's just the drudgery of it. You got to go through that. There's a couple of third party software that makes it a lot easier. Used to take about three days to change all your text over. Now you can get that done in about an hour if you've got the right add-on. And I can point that out to you later after class.

The project content, the system families, walls, ceilings, roofs, you've got the transfer project standards, that's going to go in there and do that. Your components. Hosted and stand-alone. Doors, windows, columns, beams, all those types of things in there that we're used to.

Diffusers, whatever this guy does, the mechanical side. So you got to put all that in there, whatever's important to you. The other thing, get rid of the stuff that is not important for you. OK? If you're not sure you need it, put it in. I always have the philosophy it's easier delete than it is to go find it. All right? We'll do a little bit of both in here.

Yeah.

**AUDIENCE:** [INAUDIBLE]

**BRIAN JUGE:** My line styles, when I go in there I change them up. Why? They're anemic. The thing's way too thin. I start pumping those lines, so we'll get to that in a second. OK. So yeah, go in there and start changing it out. I don't like it. Revit doesn't do it. It does an OK job out of the box, it doesn't do a great job. All right.

So talking about the View Template. View templates are hugely important. There's been a lot of progress in there over the last three, four years. We also need to do the pre-generated views. You know, set those up. If you're always doing a floor plan, a furniture plan, a finishes schedule, all that, have it in there. Have it ready to go. Especially if your billings are about the same size all the time, and I'll demonstrate that today.

Temporary templates. They're still View Templates. People forget. You have that Temporary View Template. Apply Temporary View Template. Put that in there. Think of what that is to be. OK? Have your filters in there. Make sure they're being leaned on for all the data you need. Working View templates. Again, it's still a view template, but sometimes we have working views. We'll make a working view template for that so you can quickly apply it and switch back and forth. They're all the same, but have that in your mind, that I'm going to have more than one View Template. It's not just what goes on the sheet. It's everything else that I need to get involved with that.

And then set up your product browser. I never could understand why it's alphabetical out of the box. You know? I want the roof at the top, I want the basement at the bottom. It needs to be in order. OK? So kind of fix that around. Make that work for you. All right.

Then, just going down this whole list in here, the additional settings, you got all your hash patterns, add those in. Yeah, you can add the AutoCAD ones in there. Object Styles, line weights, so to that gentleman's question, yeah I'd go in there and first thing I do is start pumping up the line weights. I go in there, because medium is, what, a 3? I'll make it a 4.

Heavy is a? 5 I need to make it a 7. And I just actually get rid of that medium thin heavy line. All of mine are 04, 05, because then I don't have to think, what's a medium line? No, it's a 5. If I need 7 I grab the 7 line. Have it makes sense. OK? Make it better standards on there.

Put in your place holder links in there and start doing your print set up. You're going to print it anyway. Might as well get it done, save the settings in there.

So before we get into this, have a clear direction in your office standard. So have a game plan when you get in there. Start with all those tedious task because you have to do it anyway. Especially when you're transitioning from '16 to '17 remember, textiles change. Letter kerning got a little bigger so all your actual text is going to get a little bit bigger. So your general notes, stuff like that, that's going to all change. Hopefully you guys knew that. Hopefully it's not a shocker for anybody, but you're going to have to go in there and change those up anyway.

Evaluate your template. I usually say three years. I do it every year, but you want to go in there and update that. Look at what Autodesk has been focusing on as far as their software updates. I mean, if you're doing rebars, there's a lot of move in rebars. There's been a lot of move in steel construction, beams, connections, things like that. You might want to go focus in on those areas. Try to look at what's new, what to focus in on that.

Transfer product standards. OK? That button is going to save you. What I don't want to see is a lot of people select your objects, and what do they do? They select their objects, they hit Control C, then they open up their template and hit Control V, and paste it on in. You're going to get all that garbage in there. We don't want that garbage in there. OK? You've got to keep that out. Use transfer products standards, load families, things of that nature. All right?

**TONY**  
**CRAWFORD:**

I was going to chime in on that one. I know some people, and I think I've seen it-- this is on, right? OK. Whoops, sorry. People have said, oh, once you start a project-- you can now save that as a new template, but I think both of us recommend not doing that. Taking any existing project, your first project, because you did figure out a lot of stuff. You spent a lot of time doing the settings on your first Revit project. It might make sense to just save that as your new template, but when you're figuring out steps, you fixed a lot of things. You also probably broke a lot of things that you didn't realize right away. And if you just make that your new template, you get all the broken stuff too. And if it's just your first, second, third project, you might not realize how it's supposed to work. So I just wanted to echo that point.

Transfer products standard is great. Once you've gone through your first projects, I know I

make a list of stuff. I probably didn't on my first project, but I should have. As I'm going through a project, oh, if I had done this in my template, I wouldn't be having to do it now. So I just write it down somewhere. If I had done this, and this, I just make a list of things because I usually don't have time to fix them right now, but at least I have a list. And then, when you're ready to work on the template, you can use transfer projects standards to bring in all the settings that you did right and skip the ones that you did wrong. Sorry. Go ahead.

**BRIAN JUGE:** Yeah, last thing, be focused-- project focused, not template focused in there. What is it to get your project done? All right? And with that--

**TONY** Let's get on with it.

**CRAWFORD:**

**BRIAN JUGE:** Yeah. OK. So, just to let you know what I've done ahead of time, I went in and started a new project, and I based it off of my template. Retail. OK? I'm going to go through a retail store here and just kind of line things up. So this is my out-of-the-box one that I've launched in here. I've already got a set of different floor plans in here, different sheets have already been established inside the project. They're ready to go. So we have different things like the project information, all that's been fired off, ready to go in here. OK?

So what is a template? A template is a Revit project that's saved as a template file. OK? So you can start off with 50, 60 70% of your building out there. A lot of our retail clients, that's what we recommend. OK? And then get in there and start working on the project itself. So that's what I'm going to do right now.

First thing, I'm going to go in here before Tony yells at me. It needs a project name. So I'll put-- what?

**TONY** I was going to yell at you for something different.

**CRAWFORD:**

**BRIAN JUGE:** Oh, he's telling me all the time.

**TONY** So, Brian, why do you have walls in your project? It looks like you've already started. Why

**CRAWFORD:** would you have walls in your template?

**BRIAN JUGE:** Because I always have walls in my project.

**TONY** It didn't even occur to me. I really did ask him that. Why would you have walls in a template?

**CRAWFORD:** Because there's always walls in a project.

**BRIAN JUGE:** Funny enough, architects draw walls.

**TONY** And it's a retail template. Pretty much a square building.

**CRAWFORD:**

**BRIAN JUGE:** I looked it up. This is the address, by the way, so just bear with me. There we go. There we go. I'm putting the address in.

**TONY** No, that's good.

**CRAWFORD:**

**BRIAN JUGE:** Yeah. There, get it out of my way. If not, he's going to yell at me. So we're assuming we've got-- a lot of this other stuff we'll fill out as we go.

Now I'm going to go into my working view in here, and first thing we'll notice is I've got some dimensions in here. And I'm using something that's called global parameters. How many people here use global parameters? OK. Couple of you. So what global parameters are, I consider them project parameters in here, but they're something new that came out about a year and a half ago. We can go in there and determine what our project is going to be. In this particular case, the global parameters I set up was basically for my bays. And I can come in here and say, oh, OK, maybe my front bay, instead of being 30 feet, maybe it's 28 feet in here. And when I apply that, it's going to go in here and kind of massage the model a little bit and re-change it. So I'm basically balancing out 600 square feet per day to get my retail store kind of set up. So I can go out in there and bounce that back and forth ahead of time. This can all be loaded inside a project. OK? So just a very simple step. Go in there, let it go in here, within a project. Any questions on these?

All right. So to set one up, you would just need to go in there and do just a simple dimension, just like anything else. And when you select it, you can now go in and set up a label for that, and that will create your global parameter. So that's new. That's kind of a great thing to have inside our project, inside.

Now at this point, I'm going to start focusing on the building itself, changing a bit of this. So let's go inside and start splitting some walls up in here, and just kind of give this a little bit more definition of what's going on. All right. So taking a couple of these. Did we split that? I'm going

to leave it there. And we're going to move this building out. It's always fun watching someone else design. There we go.

**TONY** No pressure or anything.

**CRAWFORD:**

**BRIAN JUGE:** No pressure. One big tip, you got to not disallow to join if you're going to move that wall out from the other wall. Everybody knows that one except me, so that's fine. All right. Add some definition to this place. Another thing that we're going to start doing-- that's starting to look somewhat decent-- is the walls themselves don't look that great. So we're going to start going in here and decorating these walls a little bit. Oops. I can't get that back one there.

So now, you're never going to do wall all the way the same time. There we go.

**TONY** And this is where I pick on him. Like, I only need four walls. Just do four walls and give me a  
**CRAWFORD:** break.

**BRIAN JUGE:** Yeah, yeah, yeah.

**TONY** Why do you make them undulate?

**CRAWFORD:**

**AUDIENCE:** [INAUDIBLE]

**TONY** Yes. [LAUGHS] I actually have it in my notes. I need four walls, a ceiling, title block, and the  
**CRAWFORD:** information on it. I'm like, that's five minutes and you're done. And then they start telling me all these other things that architects supposedly have to do, and it has to meet codes and specs.

**BRIAN JUGE:** Oh come on.

**TONY** Life safety.

**CRAWFORD:**

**BRIAN JUGE:** If it wasn't for us you would have nothing to do.

**TONY** [LAUGHS]

**CRAWFORD:**

**AUDIENCE:** [INAUDIBLE]

**TONY** Yeah, especially the last thing.

**CRAWFORD:**

**BRIAN JUGE:** Yeah, exactly.

**TONY** Thirty minutes before--

**CRAWFORD:**

**BRIAN JUGE:** By the way, I want to point out, this is not going to be the most glorious building you've ever seen in your life. It'll just be almost the most glorious building you've ever seen in your life. All right. I'm almost done here. Almost done here. That's the building I wanted. Yeah. There we go.

All right. So starting to get some articulation in here, trying to make things look a little bit better. Get ourselves some more. Sure. You can do whatever you want.

**TONY** Just curious, while he's, you know, drawing the boring stuff. Well, actually, I forgot to ask  
**CRAWFORD:** earlier, how many people here are architectural, architectural discipline? Just raise your hands. OK. About what I expected. MEP, like MEP engineering, low-voltage?

**BRIAN JUGE:** I saw the same hands go up.

**TONY** Could be. Or, what am I forgetting? Structural? OK. Building owner side? CAD management?  
**CRAWFORD:** General contractors? Well, what have I missed? You can yell it out. Have I missed anything? OK.

**BRIAN JUGE:** Owners, maybe?

**TONY** I said owners. You were--

**CRAWFORD:**

**BRIAN JUGE:** Oh. Sorry, I was doing something.

**TONY** He was actually being productive. So what are you doing now, Brian?

**CRAWFORD:**

**BRIAN JUGE:** Panicking. No, I'm doing fine. I'm just going in and trimming up the wall. I'm making it look good. Maybe. I think it is.

**AUDIENCE:** [INAUDIBLE]

**BRIAN JUGE:** Biggest question is why are you having multiple templates? Yeah, the reason I have multiple templates is I'm doing-- I mean, I grabbed this one specifically for this particular project in here, but for most of my work on my personal side, I try to maintain one project. I did use to have two or three. It's just a little bit hard to maintain. The fact that I can't email you a template any way, makes it virtually impossible to go in there. So my idea is if you have very similar things throughout your project, put them all in there. It's easier to delete than it is to go back and add.

Now if you have very specific client needs, you're going to need multiple templates. So on the retail side, I will end up having-- these particular clients will have things in there that they're going need specifics for. So it comes back to, first, why are we doing it? What's the purpose for getting that in there? And if you're saying, oh, I have the client needs, then sure. By all means, go in there and use it for that. But most offices I'm like put it down to one, especially if it's your first template. Go down to one, maybe two, in a commercial residential or something like that, hospitality or something. But try to put those in there for those specific needs.

**AUDIENCE:** [INAUDIBLE]

**TONY CRAWFORD:** Just transfer things in, copying things in? Yeah, I don't think there's any absolute right answer on that one. I think I would echo pretty much what Brian said. I know I've had three templates, three different disciplines, mechanical, electrical, plumbing. And I went away from that very quickly because like, oh, I need to make a change three times. And then the next day, oh, I forgot something. I need to make the same changes again three times. So I just made one big template with all the disciplines until it kind of settled down, until I stopped finding things I'd missed. And I haven't actually gotten to that point yet. They're still, I'm like, oh, if I had this it'll make me faster, if I do this it'll make me faster. Oh, they have global parameters now, maybe I can use those. So I have one kind of big template, maybe a little bloated.

Whichever discipline gets to me first, like with their red lines or set ups, they'll set up the project. And then the project setting is like, oh, the View Range is different for this building, but it's going to be the same for all three of my disciplines. So some of that stuff I'll only have to set up once, and then I'll save as. So if electrical gets to me first, I'll set it up for electrical and link in the background. That's going to be the same for everybody. I'll set the View Range. That's pretty much going to be the same for everybody. Is it a five-story building? Then I'll have that many sheets for every discipline. If it's a one story building. So I'll set up one project.

And then whoever gets to me next, I'll do a Save As, delete the electrical content, which go to 3D view, Hide the background, select everything, and it's gone, and then you'll Save As for this one, and Save As for that one. That was what I went to. I had done three templates. Yeah. I forget.

What was the other half of that question? Oh the container file? Depends on-- that sounds like-- I'm not opposed to it. I haven't done it, but it would be a good idea. Brian, anything else to point out on what you're working on?

**BRIAN JUGE:** Oh, I'm just going in here. You guys might see some of these green areas of stuff. So those are going to be where I'm going to focus in on my actual units. So I'm going to come in here and do this endcap and kind of decorate it as a quick-service restaurant and start putting things in there. One advantage of this, though, if I were to slide this around, this is where the view is being taken of from my sheets. So if I come down here into my sheets, inside the file, and I get to like the tenant floor, wherever that is going to-- whoops, I have the wrong one in there-- it's going to be taking on that particular view in there. So I can slide that around and have that focus in on that particular area because my scope box is focusing in on that. So that's what I'm doing on that one.

**TONY CRAWFORD:** So, Brian, what happens if the client, the lot has to be a different size? Long and narrow, or short and wide? Have you gone through that part yet?

**BRIAN JUGE:** Yeah, I use the global parameter for doing that. And then if this particular endcap was different I could go in there, take off the dimension that's part of that global parameter in there, or basically, essentially, delete it after I'm done with that template file, and no longer hold myself to that. So right now I'm using that global parameter in there, but if I need to break that I'll just go in and delete it. Unconstrain it. Now I'm no longer using that constraint, and now I can change each base size. So starting off I just get the general bays laid out, and then I know my endcaps are going to a little bit different. I can start pulling those apart, doing whatever, maybe the inside ones are a little bit different, but it just gives me a base to start off with.

**TONY CRAWFORD:** Did you actually demonstrate that part? Or maybe I missed it.

**BRIAN JUGE:** I kind of slid it a little bit.

**TONY** OK.

**CRAWFORD:**

**BRIAN JUGE:** So sorry if you guys didn't see that. You can go back in there and--

**TONY** Because I thought this was pretty impressive.

**CRAWFORD:**

**BRIAN JUGE:** Yeah go in there and start changing that base size, 30, or go to 28 feet.

**TONY** And watch the building change.

**CRAWFORD:**

**BRIAN JUGE:** And have the building actually update and change and move this stuff around. Now I'm starting to break it, but it's got that association for pulling that stuff in.

**TONY** So the square footage stays the same size, but you can just change the number.

**CRAWFORD:**

**BRIAN JUGE:** Yeah, so all the other bays stayed, but this one is now further out. It's 30 feet instead of 28 feet. OK? So you've got that ability to go in there and change all that in there.

So now I've got my patio area, starting to pull out what I'm going to do for the doors. And now I'm going to get in and focus in on some other stuff. First thing I'm going to start off with is getting in the restrooms in here. So I'm going to go in and insert a Revit link in my file in here, and I've got my restrooms. Now, I could have the California, I could have Texas, I could have my standard throughout the rest of-- most the other country out there.

So I'm going to prebuild my restrooms and link them in. OK? This is old school. This is, I've seen old school, because this is basically going back to CAD way of doing this. So I'm going to come in here, and I'm just going to link in a standard men's restroom inside, in my unit. Put that in there, and then I can just kind of rotate it around. Get it to where I need it to be. So I'll put that inside, go in there and move that 90 degrees, start placing that where I need it to go inside my project. So maybe I'm going to put it right there. OK? Do the same thing, link in for the standard woman's. But if you have those things, hey, I've got different code requirements out there, and they're kind of all the same, build them ahead of time. Put them ready to go. Then you can link them back in.

So the next step I'm going to do after I put them in, is I'm going to bind them into the project.

Bind them, they'll be groups. I could still move them around as groups. So I've got that in here, inserting this one in. Rotate that around.

**TONY CRAWFORD:** Yeah, It's a little bit pre-baked, but that's the point. Restrooms, there's only so many different ways you can rearrange a restroom, especially if it's retail, commercial. There's only, like I said, only a limited number of ways that the restroom's going to be. Once you've laid out a restroom, why lay it out again? You've already done that work once. You've already put in a sink, and a water closet, and handrails, whatever's in there.

**AUDIENCE:** [INAUDIBLE]

**BRIAN JUGE:** Groups inside the template. So here's my take on groups. A lot of people are like, don't ever use groups. I'm a fan of using groups in here, but to a point because groups tend to clog things up. I don't know, has anybody ever been caught with groups before where it's made groups for you not knowing about it? I do multi-family a lot. Yeah, everybody's like, clapping your hands, right? So groups, the workflow. Just like an AutoCAD, you had blocks. You can go in there and blocks, blocks you can make an x-ray, of an x-ray you can make a block. Well same thing with groups. Groups would make links, links would make groups. So I'll pull the links in and start using them as groups, moving them around. Especially if it's multi-family. Unit A, unit B, whatever. But then occasionally, you know, flipping them over.

During the SDDD phase I will stick with the groups and use them in there. Once I start to get in the CD phase, you shouldn't be moving things around that much.

**TONY CRAWFORD:** Yes, Brian.

**BRIAN JUGE:**

Then convert them-- Yes.

**AUDIENCE:** [LAUGHTER]

**BRIAN JUGE:** Hey! Yeah, yeah. That did string, right? I'm an architect. I can do that. [LAUGHTER] So we can go in there and do that. But once I get to CDs, I'm going to either convert them to links or-- basically get rid of the groups-- I'm either going to make them links, or I'm going to ungroup them and leave them as individual objects in the project. OK? That's my take because when you get to late CDs, groups slow the project down. They don't make it bigger. They slow it down. So once you have all your views in there, thousands of views you put inside, it's going to become a slower project. You're not going be able to have that stuff in there or working as

much. So get rid of them. They shouldn't be moving around. I know, I know. They shouldn't be moving around, or not much. A hair here, a hair there. But just keep them as links as long as you have to and then convert them in there. I would say 50% CDs. 50% CDs, lock them down. They shouldn't be moving. Keep them in there or just keep them as links. OK?

Where do you do the groups and links? Fire. Fire protection. That's where I decide where things are going to be divided. OK? Sometimes I'll even do gyp board, and that's the unit wall. It's just the gyp board. And the outside wall, that's part of the main model. OK? So now I can control a room, have the room elements in there, put that inside. That's part of the link, but the main model is where the fire separation is, things like that. So I start breaking it down. Where are my separations going to be? What's important for me to get my work done? Hey, the fire protection, I get can get ready to go. All right. So I've got this stuff in here.

Now I'm going to go in and put in some components in here. And I'll grab my freezer first. Put that guy in the back. Funny enough, he fits. All right. And then-- it's like I planned this-- put in the refrigeration. Put that in there. All right. Then we're going to start getting into some other stuff. So here I've got a cok line. This is a Revit family and it's got a lot of nested families inside. There is, for this particular client, there's a lot of stuff in here. All right? So I can put that in there. Who here is not using nested families? OK. Good. That's awesome. Put those in there, got the things so I can make it the ADA standard. So I can go in there, flip back and forth, everything is going to update, have those particular different sizes and stuff in here. And you can have a lot in this-- in here.

**TONY** By the way, you have of eight minutes.

**CRAWFORD:**

**BRIAN JUGE:** What? Oh, you can do this in like seven minutes, Tony. You'll be fine. I've seen your work. All right. So let's start getting in some more walls in here.

**TONY** So sometimes bringing a group, a block of things, in as a link works great. Sometimes you want to choose a family. One way to differentiate, the nested family, like the kitchen there, the equipment, that can be a nested family. It works great. The bathroom could not be a nested family. That had to be a link because walls cannot be inside of a family. So that's one differentiator. Both of them can be groups and links, and families can be somewhat interchangeable, but not completely. And there's times when it's an advantage to use one over another. And like Brian was saying, I try to avoid groups. Well, especially on the MEP side I

almost never use them. For one, because I can't connect to them. I can't circuit them to them, I can't plumb into them, so I could use it for placement and that's about it. So Brian can use them a little bit more.

But, like he was saying, coming from AutoCAD, in AutoCAD I was always told if you want to make the project faster, save file size, make it a block. OK, so in Revit you might assume that making something a group, which is like a block, would make Revit faster, but it's actually the opposite. The more groups you make in Revit, it actually slows down the software. It's just the way Revit was written. It works on families, not on blocks or groups. It's just kind of the way it was written. I know we've run across some clients where the files just keeps moving slower, and slower, and slower. They send us their file and we look. Oh, there's dozens, if not hundreds, of groups. And OK, I think we found your problem. I know I've seen one that a circle was made into a group. I'm like, why is this even in there? Yeah.

So what have you got? Now what are you building?

**BRIAN JUGE:**

Oh, I'm building the service counter, the entry in here. Kind of got a lot of my rooms set up, ready to go. Probably need to put a little more desk and storage in here, but I'm kind of getting to the point where I'll start putting in some rooms. So another thing we can do in here is you can pre-generate your rooms. So hopefully everybody's doing that. So I've got some dining in here I can start laying out. Got my patio area in there that I'll need to define. Didn't want to do that. And let's see what other rooms I have in here. And they're going to have-- yes, that's the women's, that's the men's. They're going to have all their different finishes, stuff like that in there. Especially, this is pretty standard, right? Shouldn't be any reason why I need to go back and redo a bathroom. It's kind of the same thing over, and over, and over again. So build all that in there.

Get in my kitchen. Got my storage. Yeah, that's fine. Office. Oh, that was supposed to be an office. Put that in there. [INAUDIBLE] And refrigerator. So I've got some of the different things in here. I'll go back and do a couple walls.

**TONY**

Four minutes.

**CRAWFORD:**

**BRIAN JUGE:**

Yeah, yeah, yeah.

**AUDIENCE:**

[INAUDIBLE]

**TONY** Some things you want to avoid: groups, you don't want to have too many AutoCAD links. If  
**CRAWFORD:** you're using AutoCAD-- if you need to have something linked in from CAD, that's OK as long as the file is clean. If you made the AutoCAD file, great. What you really want to avoid is hatching. AutoCAD hatching does not work well in Revit. Instead of being one block that's a hatch, every single line, or every dot, like concrete or sand, it just really kind of overwhelms Revit because it treats it as individual pieces instead of one big thing. Yeah, if you have AutoCAD files linked in make sure they're clean. If you made them-- if they were inherited, yeah this was our CAD detail that's been on the library for as long as you've had the company, and oh it came from another company from the guy that branched off and started, and it was an MicroStation at that time, and before that it was SoftDesk, and it was something else.

AutoCAD files can have a lot of baggage in there. AutoCAD is fairly robust, it won't crash, maybe, hopefully, but those things where it was OK in the AutoCAD file might crash your Revit file. So AutoCAD links, you want to minimize those as much as possible.

**AUDIENCE:** [INAUDIBLE]

**TONY** Families are good. A tiny bit?

**CRAWFORD:**

**BRIAN JUGE:** This family is going slow it down, that's for sure.

**TONY** Personally, I purge somewhere in the CD phase, 50% CD maybe. Like if I haven't used it by  
**CRAWFORD:** that point, if I'm not currently using whatever family is in there, maybe I start off with a couple of like families and then changed, at some point I'll purge out the products. And that gets rid of anything that's not currently in use. And if you haven't run the purge, you can go in there individually and check or uncheck items. So you go, well I'm going to purge everything, oh, except this item, and this item, that you want to keep, for example. So I like purging.

Compacting the file, personally, I do that maybe once a week, not a hard and fast rule. How many people compact the files occasionally when they save it? OK. That's a good idea. My understanding is what it does is it goes through-- and actually if there's any Revit programmers here, feel free to correct me-- I'm not a Revit programmer. My understanding is it goes through the file-- because it doesn't give you any feedback when you run the compact tool-- let's say you put in a door, and then you copy the door, and then you flipped it and rotated it, and then moved it around the wall, and a week later, the design changed, they were

deleted, those doors. Those doors are still in the history of the file, even though you've actually deleted them. And running the compact tool goes through the file and sees, is there anything that it can clear out? Anything it can get rid of? And, oh, here's the door that was moved, copied, rotated, code, blah, blah, blah. But it's gone, so it just removes that from the file completely. So you lose the ability to hit the undo when you run a compact, but there's other things where you lose the ability to hit the undo.

Anything you want to point out, Brian? I don't want to talk too much.

**BRIAN JUGE:** No, you're fine.

**TONY** Are those lights?

**CRAWFORD:**

**BRIAN JUGE:** Oh, no. No. Those aren't lights, man. Those are tables.

**TONY** Oh, OK. If their lights I want to know where they're at. That's all. Oh they are tables.

**CRAWFORD:**

**BRIAN JUGE:** Yeah.

**TONY** Now they look like tables.

**CRAWFORD:**

**BRIAN JUGE:** So, yeah, I got standard families in here. You know you're going to have the typical type. You can do bar, or standard, we've got ADA. Those should all be built in ahead of time so you get them fluctuating in there. So my schedule's already updating as I'm starting to put these insides. So maybe I need to rotate that around a little bit and have a couple of those.

**TONY** Two minute warning.

**CRAWFORD:**

**BRIAN JUGE:** I'm almost done. Geez. Yeah. That's the whole reason he got me on board with this. So you can just sit there and yell at me, and go, oh, look what you can do. And I'm like, yeah, yeah, yeah.

**TONY** I submitted the class in the spring. I'm like, oh, hey Brian, I'm going to submit a class. Can I

**CRAWFORD:** include you? I need an architect. Sure, whatever. A few months later, hey Brian, guess what?

**BRIAN JUGE:** We got picked.

**TONY** We got approved.

**CRAWFORD:**

**BRIAN JUGE:** For which class?

**TONY** And he said, oh, fun. Actually, he said a different word, but I can't say it here.

**CRAWFORD:**

**BRIAN JUGE:** I said different words.

**AUDIENCE:** [LAUGHTER]

**TONY** Oh, now we've got to actually do this.

**CRAWFORD:**

**BRIAN JUGE:** Yeah.

**TONY** OK. Oh that's actually starting to look like a building now.

**CRAWFORD:**

**BRIAN JUGE:** Yeah, yeah, yeah. Some other furniture in there.

**AUDIENCE:** [INAUDIBLE]

**BRIAN JUGE:** These particular families, not all of them, but they should be. [LAUGHTER]

**TONY** Mine are.

**CRAWFORD:**

**BRIAN JUGE:** Do as I say, not as I do. No, most of them are. And that's one of the things I talk about. Infecting your files. And that's a huge thing. And it's so hard, as a BIM manager, as a CAD manager, to keep those damn things clean. When you go online, and getting them in there, always-- if you can-- put them in a sandbox file and clean them. Get rid of those AutoCAD lines. I spend more time cleaning that up in an office than I do actually making the template work well. I hate that stuff in there, so the AutoCAD stuff you've got to get rid of. Sometimes it's just-- in some firms it's inevitable. You're going to have it inside, but you've got to purge them out.

I don't know, what do you guys think? Is it starting to look like a building? Inside? Maybe shortly? Uh, it's looking close enough. So we can put in some signage, and--

**TONY** Oh yeah.

**CRAWFORD:**

**BRIAN JUGE:** Sorry, we'll do Tony's.

**TONY** Yeah, your time's up.

**CRAWFORD:**

**BRIAN JUGE:** Oh come on. Then I can actually get into what I want to talk about. Put that on your stuff there. Never could understand why it always comes in upside down.

**TONY** Now see, I haven't had that problem.

**CRAWFORD:**

**BRIAN JUGE:** You haven't?

**TONY** But then I don't do as much 3D text.

**CRAWFORD:**

**BRIAN JUGE:** Yeah. Whoops. Another 90 degrees.

**TONY** Ah, that'll work.

**CRAWFORD:**

**BRIAN JUGE:** Yeah. There we go. So we got kind of a OK, decent building in there. What do we get out of this? Why do we do all this work?

**TONY** So if you hit print right now, what would you get?

**CRAWFORD:**

**BRIAN JUGE:** I'm going to get a lot of stuff if I hit print right now.

**TONY** He's got a reference point. I made him put them in there.

**CRAWFORD:**

**BRIAN JUGE:** He made me put a reference point in there. I said, do you want ceilings? He said, yeah, put them in, not put them in.

**TONY** The height of the ceiling.

**CRAWFORD:**

**BRIAN JUGE:** I've got a ceiling height inside. So if we go in there to my section I'm going to have it in here. But furniture schedule is starting to get filled out. I've got that in there with all my different marks and stuff inside. I've got my wall schedule kind of starting to lay out in there for putting what's inside. I'm starting to see different views, so now I'll go in and start tweaking the views. Get those ready in there. Equipment schedule's ready to go inside.

**TONY** So there's a sheet, there's a schedule, there's a floor plan.

**CRAWFORD:**

**BRIAN JUGE:** Activate that view, and then I can just go in and annotate, say tag all, and get to, let's see, specialty equipment. Put that in there.

**TONY** I mean if we had like two hours to set this up, that'd be great, but we had like 30 minutes each.

**CRAWFORD:**

**BRIAN JUGE:** We start getting all that text loaded in there. Probably need to put that one in there too. Oh, I forgot to do links. So I include my links when I'm putting those inside, to have all that data associated with it. And then the restroom plan. Oh, forgot to do the restroom plan.

But at this point, I'm going to go in here and do a Save As.

**TONY** Yes please. Save in on yours and then the thumb drive.

**CRAWFORD:**

**BRIAN JUGE:** OK.

**TONY** Or vice versa. Just don't forget to save it on yours too.

**CRAWFORD:**

**BRIAN JUGE:** True. Now I'm going to be nice. I'm going to Save As and purge it when I give it over to him. Right? Because everybody does that.

**TONY** Of course.

**CRAWFORD:**

**BRIAN JUGE:** When you hand your files off to your other discipline, as architects, you always go in there and

Save As, and purge your files out before you hand it to your other disciplines.

**TONY** This is why I like this guy.

**CRAWFORD:**

**BRIAN JUGE:** All right.

**TONY** Plenty of projects where the file's huge, I'm downloading it. I purge it, I'm like, wow, it's half the size. If they had done that before they uploaded it, then all five sub-disciplines wouldn't have to download these huge files and then five people won't have to run the purge, if somebody did it ahead of time. So that's good.

**CRAWFORD:**

How many people do purge the file, your files, ever? Does anybody have a rule of not ever purging your files? I know I've run it to a couple companies. One I worked with, somebody purged the file early on in their first Revit project, and then they spent the rest of that project, the next year, reloading stuff. So they made a rule.

**BRIAN JUGE:** Sir.

**TONY** OK. Never ever, ever purge the file.

**CRAWFORD:**

**BRIAN JUGE:** I'm done.

**AUDIENCE:** [INAUDIBLE]

**TONY** No, I'm going to link his into mine. We're actually doing Sneakernet thumb drives.

**CRAWFORD:**

**BRIAN JUGE:** He wanted it as real as possible. And I was going to Martha Stewart a file and just be like, here, it's done. But he's like, no, you can't cheat on this one. So now the idea is that he's really getting it. So you guys really were-- this could have been a major train wreck. Now it's just kind of a minor train wreck. So we're doing all right.

**TONY** That's true, this is live. I'm copying his file.

**CRAWFORD:**

**BRIAN JUGE:** So now that I'm offline, as Tony's starting to get synced up in here, I'll kind of go over some other things to talk about. So in there, demonstrating how you can have those families kind of

pre--

**TONY** Can I jump in just while I'm starting?

**CRAWFORD:**

**BRIAN JUGE:** Sure.

**TONY** So I'm on the blank screen, I have a template, that's just what I named it. I'm starting a brand  
**CRAWFORD:** new file. Brand new blank file. I call it a blank file, but it's not an empty file. This is my splash screen. I'm assuming everybody has a splash screen. I like to use sheets, a sheet instead of a legend or drafting view because these are parameters. These are the labels. This will automatically update. And I will never have to type project name, owner's name, client address. My project number I'll have to type that because that's unique to me. The rest of it I'm going to steal from Brian's file.

**BRIAN JUGE:** Psh.

**TONY** [LAUGHTER] So that's just my splash screen. If I go to a 3D view, I do have a sample file. You  
**CRAWFORD:** can tell that's not a real building, but by having what I called-- what did I call it? Dummy architectural file? Dummy link architecture is what I call this one. By having that in there, I can set Visibility Graphics, I can override things. I can make things halftone. I can go in and set settings on the architect's file even though this clearly isn't the building. So one of the first things I'm going to do is find a file, reload, from, and then I can choose a new path.

So this is just modified, project one. That's a good name. [LAUGHS] And magically my building--

**BRIAN JUGE:** It's a great name for a project.

**TONY** Oh, OK, so you have your links as overlay. So I need your links too.

**CRAWFORD:**

**BRIAN JUGE:** You're fine.

**TONY** OK.

**CRAWFORD:**

**BRIAN JUGE:** You're missing one furniture.

**TONY** There's three. I think the bathrooms. Anyway.

**CRAWFORD:**

**BRIAN JUGE:** The bathrooms are groups.

**TONY** All right.

**CRAWFORD:**

**BRIAN JUGE:** I fixed that.

**TONY** So now I have the building and my Visibility Graphics are already set for this. I know I like to  
**CRAWFORD:** make-- where's my elevations? Elevations. The background is halftone so i can tell what's my level, what's the architect's level. In fact, since I'm here, I don't need level 5, I don't need level 4. I'm going to just delete those. So in my template I have a fifth floor, plus a roof, couple other penthouse, parapet, just in case I have a building that needs those. There's sheets associated with those, there are views associated with those, a few templates tie to those, but if I don't need them I delete them. But they're still there for the next project when I do.

So at this point, I could add-- if I was going to do work sets I do that first. If I was going to acquire coordinates I'd do that now. Skipping those just because you don't need to watch me do too much work. Let's see. Level three, I don't need that. Delete that one. And all the related views, you can see I have lighting, power, mechanical, plumbing views are being deleted because I don't need those anymore. So my level two, oh you don't have a level two.

**BRIAN JUGE:** No level two's.

**TONY** I'm just going to move that because I'm always paranoid that next week he's going to add a  
**CRAWFORD:** level two. So I'll just move that out of the way. We can just ignore that for the moment.

**BRIAN JUGE:** What? No, no, it's retail. We'll never had a level two.

**TONY** I know. So where my roof should be--

**CRAWFORD:**

**BRIAN JUGE:** Until next week.

**TONY** There it is. I'm going to make my roof 20 feet. So now my roof matches and parapet. Did you  
**CRAWFORD:** spell parapet wrong?

**BRIAN JUGE:** I spell like an architect, so yes, I did.

**TONY** It's the French spelling.

**CRAWFORD:**

**BRIAN JUGE:** There was a lot of spellings in there.

**TONY** 24.

**CRAWFORD:**

**BRIAN JUGE:** Exactly, it's French. No. There's a lot of Easter eggs in there, Tony. You should know me by now. It's called Easter eggs.

**TONY** Top of storefront. Where's your ceiling?

**CRAWFORD:**

**BRIAN JUGE:** That's my ceiling reference plane. You told me to make a reference plane called ceiling and I did.

**TONY** He did. So I'm going to align-- this reference plane is in my file, it says zero on the ceiling. If I  
**CRAWFORD:** zoom in, it doesn't get any bigger. So I have that in there. I can use it. I want to copy his. So if he doesn't have a ceiling-- because this is the very first deliverable, started 35 minutes ago, he doesn't have a ceiling in there yet. I'm going to move mine. I could type in a value. I'm going to do a line and lock. Or a line. I guess I could lock it just in case there was a rounding error. It might say 19 feet and zero inches. Because of the units and the rounding I like to use a line frequently. Because it might be 19 feet, zero inches, and 1/256 of an inch. You know, if he moved it or used the arrow keys I want to be exactly where he is at, regardless of what it is. Let's see, what was I going to do? OK. I think, I'm just going to delete level two. I really don't need that, and all those views go away with it.

Which leaves me with all the levels in the right place. Oh, copy monitor, I almost forgot that part. Did you notice I moved my levels to match-- I'm ignoring top of storefront. I'm pretty sure I don't need that one. If I do I'll come back later. I don't need top of footing, if you had bottom of concrete, top of concrete, I usually ignore those. So collaborate, copy monitor, select link. And I already have the settings in here set to reuse levels if they match exactly. So watch what happens when I copy. I'm choosing copy even though I really don't need to copy any levels. I just always do it the same. Then if I do need to copy in levels I can do it with one step.

I'm copying in his main floor. Watch what happens to my level one when I click main floor. Renamed mine to match. Roof, OK, it started with the same name. Parapet, now mine's going to be spelled wrong, or at least spelled French.

**AUDIENCE:** [INAUDIBLE]

**TONY** And finish that up. Now my views have adjusted automatically to match. I don't need this one.

**CRAWFORD:** So let me, I'm just going to go to coordination. Oh, I was like, where's my second floor? Oh, but I deleted it. Right.

**BRIAN JUGE:** I don't have a second floor yet.

**TONY** [LAUGHS] Mild panic. Oh, I also need to, because he gave me his title block-- oh wait, he

**CRAWFORD:** didn't. I need to go ahead and open that file. And very quickly and easily I can steal his title block.

**BRIAN JUGE:** You guys don't need my title block. You just have to match it.

**TONY** Exactly. So I could rebuild it. Where am I going? Sheets. Sheets. There we go. Open up the

**CRAWFORD:** title block. Come on, you can do it Revit. There it is. Nope, OK, I turned that off. Edit family, and now I'm done with this file. I have this, I'm going to put in my logo. Oh, I should have turned that on. Where am I going? Insert. [INAUDIBLE] There it is. Sorry. It's hard to find things when people are watching you. Not even that. OK, just-- there we go. I was going to say, I'm going to give up in a second and just pretend that I put my logo on there.

**BRIAN JUGE:** One thing you're seeing on that title block there, I've got just a field that says "Not For Construction", that's a beautiful thing to have, and keep it turned on. So you're testing things out for clients, you just kind of leave that on the whole time. Make it a type parameter.

**TONY** There's his type. Visible. See the tiny little button. I want to do a blog post, as soon as I create

**CRAWFORD:** a blog, on the hidden buttons in Revit. I don't know if you can even see that one on the screen. There's this tiny little button that opens up a world of possibilities. Load in the project, load into my project. Oh, I can't complain about your name. I haven't saved mine either. I don't know which one it is. They're both named project one. So I don't need that one. OK, so what file is mine? OK yours, well they're both called project one. OK, I'm going to have to save my file. I was expecting you to have a file name because clearly I don't. OK.

**BRIAN JUGE:** I named the project.

**TONY** Save the file. Project one. I'll call mine MEP at least. Stupid helpful computer.

**CRAWFORD:**

**BRIAN JUGE:** So while Tony's is doing that, I'll go back a little bit on what I was doing initially in there. So in the beginning, we saw that we had global parameters. You can set those up. I like to call them project parameters because you can specify them for the actual project, although we have project parameters. The project parameters are a little bit different. Having that in there you can have your grids laid out ready to go. So you can get things lined up, but you can also have other types of global parameters set up in your project. Almost-- almost-- anything that you would have that can be parametric, you can put in there.

One that I was really trying to get to work out was like an array parameter. You can't make an array parameter a global parameter and have it buried inside. That would have been a nice idea in there because I could have said, well how many bays do you want? And then kind of change that to have different amounts of bays. So I just figure, well, I can always add and copy those later on after I get the general base size done within there.

If you're always working in the same jurisdiction, you know, look about your codes, your coding requirements. Put all that buried in there. Have your occupancies ready to go within the project. So right when you start dropping in those rooms, you're going to have your counts already done, you can start looking at how many plumbing fixtures do I need, what's my exit egress going to be, and then you start measuring the diagonal distances. All those requirements in there. How wide your stairs need to be. And then you can have filters built in that would establish are you hitting these numbers? Are you getting the correct size out of this? Especially if you keep going through the same jurisdictions. OK? Shouldn't be that we don't have these linked in there.

We can have those tied into like area plans, and stuff like that, so you could have the right types of separation. What kind of usage is each room being built into? So you can go back to your original code, you know, what is this? Type 5? Type 2? Am I sprinklered? Am I not? Having those things built inside your template, it's going to be it's going to be easier for you guys to make sure you have your numbers in there.

Your global parameter will be great for frontage code. Am I 60 feet? Am I inside 60 feet? I might even get that bonus when I'm starting to put that together. A lot of the architects know what I'm talking about.

**TONY** And I was going to point out, I just definitely want to point this out. I have sheets that are set up, there's my mechanical legends and notes, got my title block in there. But I already have all these sheets set up with the wrong title block. It's even a different size. So I could load his in there and then manually select every sheet change the family, select a sheet, change the family, select a sheet, change the family. Or I can trick Revit into-- and then I lost it-- automatically updating. There's my title block, make sure it's the right one. TBE1 30 by 42. OK. I'm going to rename that to be the exact same name. So I just copied and pasted his title block name. There it is.

Now I have that in there. And in fact mine, my title block, even though it's my title block, it has his name. The name of his title block. So when I load that title block into my family it automatically updates. Come on, load in the project. There it is. Load in the project. Load in the project and close. It will update all of my sheets. And I just saved myself how many steps? How much time? Oh no! [LAUGHS]

**BRIAN JUGE:** Select like all instances.

**TONY** Last time I tried that with the title block it didn't let me do that, but OK, that was a couple of versions ago. Now you can. Oh great.

**BRIAN JUGE:** I think you overrode the wrong way.

**TONY** I bet I did then. Oh, this has never happened to me before.

**CRAWFORD:**

**BRIAN JUGE:** [LAUGHS]

**TONY** Well, in theory that's what you do. I guess I clicked on the wrong file. I really should do this.

**CRAWFORD:**

**BRIAN JUGE:** An earlier question that came up, what about CAD files? OK. As a lot of people are starting to progress over, they're going to have like their standard details and stuff like that, that they've been using all along. I eventually want everybody to get into creating 2D intelligent details. OK? There has been a lot of classes, we've done some ourselves on that, webinars, there's a lot of things online. You can look at either my files or Brian Mackie, or a couple others of us out there kind of preaching that. However, I know we have to make money. OK? You're going to probably not be changing a lot of those details. You know, to make money just bring them in,

but you're going to be infecting the file. Know that that's going to happen. You're going to bring in those CAD line weights over there. So maybe you keep them out of that template and then link them in.

Yeah, I think I had a question over here.

**AUDIENCE:** [INAUDIBLE]

**BRIAN JUGE:** Yeah. So the way to go in and do that, to redo your details, is to do exactly that. Have those CAD details in there. Say that again?

**AUDIENCE:** [INAUDIBLE]

**BRIAN JUGE:** You're asking will it ruin the integrity of the template once I--

**AUDIENCE:** [INAUDIBLE]

**BRIAN JUGE:** Um, depends on how far you adapt that in there, but I always go back in and check the line weights because inevitably someone is going to-- they are going to show up. So you're going to have to go in there and clean them up. It's just a matter going there and going to Object Styles and clearing them out of there, and going to your line styles to make sure they're out of there, depending on which way. If you're bringing them into families or bringing them into the actual project.

Build those detail components out there. There's 800 detail components out of the box. You can easily make a rig that will do all kinds of sheet take offs, things like that in there.

**TONY CRAWFORD:** And I'm at a step where I want to actually point this out on the screen. So I've got my title block updated. Sorry for the delay. I overwrote the wrong file. Transfer project standard. How many people use this for bringing in-- OK. I always use this for-- when I set up a project, I'm on my title block, I can't zoom out at the moment, but when I transfer project info, nothing else. I don't want to bring in anything else from his file. I don't want his duct settings, his light settings. No, I just want project [INAUDIBLE].

**BRIAN JUGE:** Those are good duct settings.

**TONY CRAWFORD:** And my project, my title block, is now updated with the client name and address, whatever he typed in. Capital letters, spelling, did he abbreviate Nevada? Did he spell it out? Did he spell out street, did he abbreviate it? Did he capitalize-- doesn't matter, I get exactly what he typed

in. So he can't come back to me and say, oh, yours is different. You spelled something differently. I get exactly that. Downside of transfer project standards is I have to go back in-- there it is-- project information. Buried under energy settings, buried under other options. So it overwrote actually all this stuff, but there is one export category that is different from coming from an architectural file. So if you do the transfer project standards, you really want to check this. The energy settings, the additional settings. Especially if you're using those. So I had to go back and fix one. And I know I've made that as a suggestion. If anybody's going to the Autodesk Revit ideas forum you can vote that one up, to separate project standards into product setting info and energy info because, I'm like, they're two different things. I want his product info. I don't want his energy information.

**BRIAN JUGE:**

And for those of you that are the primaries in this group, the architects, the engineers, whatever, that are supplying this, that's one that I'd go back to my MEP and actually request that for now, and get that in here. But we wanted to show that that's going to mess him up when he's starting to transfer that information over. OK? Because that's got to be invaluable. Had we done that, that would have saved him quite a number of steps. Hey, what do you need? Let me take that, let me transfer that in, or let me have that built into my template ahead of time. That way I'm not causing you harm when you go to transfer this over.

Getting back to the detail ones, [INAUDIBLE] --the detail question again. So building up those intelligent details, if you're going to change anything about the detail, that's when I make it a Revit detail. OK? So when you're going in and you're changing it-- if you're not, keep it as a CAD detail. But hopefully two, three generations into that project, after two years hopefully you're done with that. Make them smart, intelligent details. And what I mean by smart, make sure you can tag everything in there. If you're just putting notes in, keep with the AutoCAD. What's the point? You don't have any intelligence that you can't have in there. But if I had like 30 pound felt on my drawing, I could actually change that over to the appropriate number, ice and water shield, something like that. And when I change it in one area it's going to change it through all.

Don't draw with lines in your details. Don't use lines. Build a family that's a line. You want flashy? Don't use a heavy line. Go build a Revit family that's for flashy. Building paper, everything else. Don't use any type of line types. And when I'm going to build those out, make them look good. Make them look pretty. Open up your Francis Ching book. I know most you have that out there, right? Go back to that. That's how we learned how to draft. Make it look

like that. Even going so far to start making little wavy lines and make them look more handcrafting, doing over shoots and stuff like that in there. You can make these look good. You don't have to look at it as stark as it is.

Especially, I do a lot of residential design. That's the first thing everybody wants to do in residential. I don't want it to look the out-of-the-box. I don't like aerial. I don't like these types of things. Go in there and change all that. Take your time and put that together. Yes.

**AUDIENCE:** [INAUDIBLE]

**BRIAN JUGE:** I would make a family because I can tag it. And if I go in there and it's a zinc flashing, and all of a sudden we are going to change it to galvanized steel or something like that, I just rename it, change the type comment. Because it's a family you cannot do marks. You can do type comments though, so I'd make a type comment now say, you know, 16 gauge whatever it is, and switch it, and then all of them change. Every single detail I had as zinc are now changed over.

**AUDIENCE:** [INAUDIBLE]

**BRIAN JUGE:** I would just use in a detailed component. So the question is would you just do it as a 2D or 3D detailed component? I would do these all 2D. Most of my standard details, these are all 2D intelligent detail components. I just started to build all of them. OK? Maybe I should pull that out. Sounds like a good topic right now.

**AUDIENCE:** [INAUDIBLE]

**BRIAN JUGE:** I am personally not, but yes, if you're using keynotes I'd definitely highly recommend putting that together and putting keynotes on all those because, again, that's good, you can bury that into the family. Whatever you can put in the family. Again, the mark and the type marks, those will not be in the family. You can't associate tags as a family. So when I go bring you those detail elements, they will not have that mark in there. So I use type comments and bring it in that way. I don't load every single detail component I have inside. I will go build whole wall sections and have them ready to go. Yes.

**AUDIENCE:** [INAUDIBLE]

**BRIAN JUGE:** There's a lot of theories out there for putting that up, and one other thing is, yes, we can have separate files. There's actually quite a few mindsets on this. One person I know, they build

them, and they're not doing them in detail-- drawing a blank-- detail views. They're actually going in there and putting them in elevations and in plan views. So any plan details are in plan, any elevations are in elevation, as a separate file. And then going in insert view, from file, and then going in selecting each detail that they want. And that's how I've been doing it in the past with a lot of mine. Mine are just in drafting views, but I'll just bring those in, and then I'll go tweak the outside because for every project the standard wall construction is not going to change. Standard wall construction is going to maintain the same. I'm just going to go out and change out the exterior. I've got all wall, that I just draw a line, it draws in my studs, my gyp, my building paper, air gap, waterproofing, and the stone on the outside. And I just click a button and say, no, it's efis, and everything changes. No, it's two by four instead of two by six. And all they draw is one line. It's just nested detail components in there to create one wall assembly.

And then in here, mostly it's a standard template. I just create a section and say link another view and go point it right at it. And then when you click on it you're right at that detail.

**TONY** OK.

**CRAWFORD:**

**BRIAN JUGE:** Where are you at, Tony?

**TONY** So I'm adding lights. You didn't put any lights in it, did you?

**CRAWFORD:**

**BRIAN JUGE:** No. You told me not to.

**TONY** OK, no, I'll take care of it. So I'm putting these random. I'm going to play architect for a

**CRAWFORD:** second. The first ones I put in in a straight line.

**BRIAN JUGE:** Ah!

**AUDIENCE:** [LAUGHTER]

**BRIAN JUGE:** Help me out so I can have a punching bag. All right.

**TONY** So, and I started to put in the other bays.

**CRAWFORD:**

**BRIAN JUGE:** Tony, you got to rotate them 26.7 degrees.

**TONY** Yes, OK. 26.7. I use keyboard shortcuts a lot. 26.7. OK, that one's rotated. So I'm putting in  
**CRAWFORD:** lights. I'm hosting them to the reference plane.

**BRIAN JUGE:** Looks good.

**TONY** [LAUGHTER] I'm hoisting them to the reference plane. So whether I have a ceiling or not I can  
**CRAWFORD:** do this. I mean, whether he has a ceiling in there or not, maybe it will be next week, doesn't  
matter. I can move mine to match because I'm on the reference plane. I also-- actually let me  
go back to the last view. I did this in my mechanical plan view.

Hopefully you're using this when you add the spaces. So analyze, space, you can have spaces  
already preset. So this one has my HVAC loads in there. These are set to the ASHRAE  
settings for office space open, office space common, corridor, concourse, retail mall, retail  
department store. I'm going to choose that one because I know at this endcap is going to be a  
retail department store. Now it's already done. If I do the analysis that part, anyway, is ready to  
go if I do heating and cooling loads. So I did want to point that out.

Oh, and if you're not already doing it, there is the space naming utility. It's got to be right in  
front of me. Why can't I see it? Oh no.

**BRIAN JUGE:** Because it's live.

**TONY** Yes.

**CRAWFORD:**

**AUDIENCE:** [INAUDIBLE]

**TONY** Yes.

**CRAWFORD:**

**AUDIENCE:** [INAUDIBLE]

**TONY** Oh, thank you. Give that man a prize.

**CRAWFORD:**

**AUDIENCE:** [INAUDIBLE] [LAUGHTER]

**TONY** Thank you. You just saved everybody 45 minutes. I still don't see it, but--

**CRAWFORD:**

**AUDIENCE:** [INAUDIBLE]

**TONY** Oh geez.

**CRAWFORD:**

**AUDIENCE:** [INAUDIBLE]

**TONY** You're right. OK. Oh, they did to totally change this. All right. So space naming utility is great.

**CRAWFORD:** And now-- did you put rooms in there?

**BRIAN JUGE:** I put areas in. There was already areas loaded in, and I put rooms in just that endcap.

**TONY** Oh, gotcha, OK. So women's, men's, there we go. Office, kitchen. OK. So now my room

**CRAWFORD:** names, my room numbers, match his. Yeah. But the data in there-- so storage area, I forget. I was kind of going quick and picked random things. So this one's already set to be my-- what'd I do? The space analysis? Heating and cold? OK, it's merchandising retail. That's just what I picked because I was kind of in a hurry. It's close.

**BRIAN JUGE:** Well I was going to do a shoe store at one point.

**TONY** OK, that's true. You were going to a shoe store. Maybe that's why I had those in there. OK. So

**CRAWFORD:** I put in lights. I put in spaces. I can do my analysis. And, honestly, I probably might abridge some of my design work because you don't need to watch me design. That's the boring part. Once I have equipment in there-- oh I need some electrical receptacles. I need some receptacles so I can do circuiting. Come on. So there's my circuits, or my lights. So creating a circuit-- oh, let me do a panel. Adding electrical equipment so that I can circuit it up. Electrical equipment, 208 MLO, that will work. I'm going to put a sub-panel in this.

**BRIAN JUGE:** You have like twelve minutes.

**TONY** OK. OK, I'll put a sub-panel in two of these. So when I circuit this, I'm going to give it a name.

**CRAWFORD:** Sorry, I still have to do some design work. So there's the one panel. This is going to be panel PP-2 because I don't know the room number on that one. This panel is going to be PP-Power panel one. PP-1.

If you haven't already done the circuiting in Revit, I'm assuming anybody electrical has done the circuiting, I think it's really pretty quick. And even if you're doing your loads, your panel schedule is somewhere else. I selected the objects, created a circuit, run it to panel-- oops,

that's going to be PP-2-- if you want to draw a wire it's one click. And now I have a circuit on a panel with loads. These other lights, I'll put everything on. Select everything. Filter is a great tool. I just want lighting fixtures. Come on. Circuit that up, run it to panel PP-1. All right. The wire, if you want to show that, it's one click. OK. So now I have circuits, I have panels, I have lights.

One thing that I cannot put in my template is the actual panel schedule because you have to select a panel and then run the command. And if I don't have a panel in there, create panel schedule, I'm just going to go with the default, I have exactly one circuit on there. And hopefully you don't want me to keep adding more circuits and stuff. I have a panel schedule for that now. Panel schedule for the other one, create a panel schedule. Now have the two sub-panels. Just pretend that I added more receptacles, maybe more lights in there.

You've got the load. You can re-balance those loads. Oh, that is one thing that I do need to add to my sheets because they didn't exist before so I couldn't add it to my sheets. That's one of very few things. Heating and cooling loads is another thing. So I've got spaces in there. Analyze, analyze, analyze, heat and cooling loads. Pretend I typed in Las Vegas just so you don't have to watch me type. VAV, single duct, that's going to be good. These rooms are already set. Well I'm just going to calculate that. And, anything you want to jump in while this is kick-- oh that was quick. Right, small building. I was going to say I've got like 10 seconds now while it calculates that, but it's a really small building.

So I added spaces. How much time?

**BRIAN JUGE:** No, you're fine.

**TONY CRAWFORD:** Going to do mechanical layout. So let me switch over to

**BRIAN JUGE:** You've got five minutes.

**TONY CRAWFORD:** Mechanical. There's my HVAC floor plan. Oh, I do need to adjust the view range. Brian, how high is your ceiling?

**BRIAN JUGE:** I think it's 14 feet.

**TONY CRAWFORD:** Oh that's going to be plenty. 14 feet. Actually, whatever. Close enough.

Putting in HVAC. Systems, air terminals.

**BRIAN JUGE:** See, wasn't the architecture more exciting?

**TONY** Yeah, sorry. [LAUGHS]

**CRAWFORD:**

[APPLAUSE]

**TONY** That's why everybody wants to be an architect. Let's just go with that one. Oh make it-- how

**CRAWFORD:** high do you want the stuff in the ceiling?

**BRIAN JUGE:** If I put it to bottom at 12 feet because that's where my storefront's at.

**TONY** OK.

**CRAWFORD:**

**BRIAN JUGE:** Or you could go higher.

**TONY** I just figured if I go anywhere else you'll want me to change it.

**CRAWFORD:**

**BRIAN JUGE:** So 13.8 feet.

**TONY** Placing some air terminals. Has anybody used the auto layout? I think once you've done it a

**CRAWFORD:** couple times, I think it works pretty well. So I selected those. I'm going to create a duct-- oh, I need to do mechanical equipment. Mechanical equipment. I've got my VAV fan power, let's go with a size 4, 12 inch, we'll place this-- yeah-- I'll put this one, I was just think where do I want to put this, I'll put it at 16 feet just because. I'll probably have to change it later. This is going to be up above the kitchen. Well, shoot. I'll put it up above there.

**BRIAN JUGE:** Don't put it [INAUDIBLE] by a vent.

**TONY** I'm afraid it's going to be too close. So the auto layout works great when it works great.

**CRAWFORD:** [LAUGHS] A lot of times it doesn't-- oops, I should have-- sorry. If I'm talking and clicking at the same time I can forget things like equipment.

**BRIAN JUGE:** So a lot of--

**TONY** Oh, so, to do the auto layouts. I'm ready to do the automatic layout. I have things selected.

**CRAWFORD:** OK, I don't have it selected. Control-tab. If you're not using control-tab you absolutely, positively, need to use control-tab for a lot of different stuff. So there's my automatic lay. Honestly, that doesn't look half bad. We're just going to go with that. Generate layout, and-- OK, open connection. OK, it doesn't always work right, but if half of the automatic layout is wrong, I figure half of it's right, and it just did half my job for me.

So if I look at this in my 3D -- there's too much architectural stuff in the way. Let me switch this to mechanical. You can see it did the basis of a layout. OK. Honestly, it usually works a little better for me. Oh there we go.

**BRIAN JUGE:** Oh, your lights.

**TONY** Yeah. And I thought I did that. I need to go into a setting and set that to be higher. Other  
**CRAWFORD:** projects there's been a lower-- it was a lower ceiling height the last time I ran this. It's another thing you want to put in your template. Maybe it's one of those, do as I say, not as I do.

**BRIAN JUGE:** Yeah.

**TONY** If I set that up ahead of time. But, again, I don't want you to be watching me do the design  
**CRAWFORD:** work. And on that note, you know what? Oh, keynotes. I'm just going to add a couple keynotes because I have those set up in here. On the annotate tab, keynotes, user keynotes. You can customize this, absolutely. I have a webinar that I did for AU a couple of years ago. It's just over an hour on-- I don't even know what I clicked on-- mechanical. --on customizing the keynotes out of the box. They work, but they give you the master spec. I think I've talked to one person that actually uses that for their keynotes, for their flag notes. So you can customize that. You can change the shape, change what's in the list. You know, this is all this random stuff I put in the text file.

So I have keynotes. Once I put these keynotes on the sheet, I have my sheets already set up. They will automatically appear. They're automatically numbered. Only shows me the ones that I'm using. Let's see. You know what? What if I just hit print right now? I'm just going to-- you know what? Want to save the file. And I'm just going to hit print.

Pretend that I laid out the rest of the building. I've got rooms, I've got numbers, I've got a duct layout, I've got lights in there. I should add receptacles, but again, you're here to learn the Revit tools. Not to watch me pretend to be an engineer. OK? I'm just going to hit print. Print to

blue beam. I already have settings in here. What do I want to print? I really wish that this one would stay. I have sets already in here. I have an olive MEP, I have electrical, lighting, electrical power, both, I have HVAC, I have a plumbing set, because it's pretty much always the same sheets every time. Mostly. I can go in and tweak them. For example, I don't need these other floors. I don't need a second, third, fourth power. I don't need the second-- so I should have gone and deleted those. Fourth. Second, third, fourth.

And I'm just going to make sure my print set up. I already have those set in there. It's a 24 by 36 title block. I going to blindly hit print and pretend to have faith in myself that I have it set up right. And there's always things that I'm going to go back and tweak. I'm constantly working on the-- well not constantly. When I have time, constantly working on my template. So printing right now. This is kind of the payoff of all the time we spent up ahead of time. I have-- oh, I didn't put the panel schedules. Almost everything is set up ahead of time. I have to put the panel schedules on the sheets, and I have to put one other thing on the sheets. I couldn't do the panel schedule ahead of time.

Everything else I already have set up. I have sheets, their name, their number, and I have views on my sheets, I have enlarged views, I have detail views, I have sections, I have elevations. Everything is on there. I might need to go in and tweak them a little bit. Printing this blue beam.

While it's waiting, how many people use Blue Beam for their PDF software? Awesome. [LAUGHS] And if you didn't raise your hand, check with us later to see why or your coworker. OK. There's the title. I never had to type that in. The building name, the client name, the address, our name. I have a sheets schedule on here, and my title sheets. Actually it's my electrical sheet. There's all my electrical sheets. There's my sheet list. It's already there. If I had revisions, it's got current revision. Let's see what else I have. Come on. Zoom out. I don't even know what my sheets are. Legends and notes, I have the floor plan. There's my floor plan. OK, I need to tweak it. I need to move it just a little bit. That'll take a little bit of time. I have enlarged views already there. They're already existing so they're already on the sheets. They're already named, they already have Visibility Graphics, they already have view templates on there. All I have to do is move them around just a little bit.

OK, there was before I didn't have-- I have detail sheets on there. Might need to change that for each one. Oh, I have luminaires schedule. Yeah I don't have a whole lot of lights in this one, but it's automatically there. Whatever data you want to put in. Do you want the loads? Do

you want the volt amps? Do you want the room number that it's in? Do you want the space number where it's located? Wherever you want your luminaire scheduled, you can have that preset.

Let's see. I have electrical power schedules, power notes, my power floor plan. This one's lighting. Enlarged views for those. If I don't need the enlarged views I can delete them. It's very quick and easy to delete things. So I think both of us err on the side of having maybe a little too much in the template. Like my levels. I had enough for a five-story building. I didn't need them. I could delete those almost all at once, and it deleted views that go with those. I have details, elevation, schedules. I do have a mechanical cover sheet. It's got a sheet list. Yeah, OK, I need to tweak it a little bit. But little adjustments are pretty quick and easy. At least I have a set that I can print. Now I'll go back and tweak it. Every project's a little bit different.

I'll customize the notes. Might customize the keynotes. There's my keynote legend, speaking of keynotes. Those notes are automatically up here. There's my keynote text. There's a keynote number. If Revit sees a keynote on a floor plan, it puts it on the sheet, assuming that you have that keynote legend on the sheet. So I did that ahead of time. If for some reason I don't need it, it's pretty quick and easy to delete things. Enlarged views. Some of the same stuff. One line diagram, OK, I put one-line TBD. I have other sections, elevations, HVAC schedules. So my air terminals are listed in here.

I have an all MEP sheet, cover sheet, if I need to use that. I have this one set up. And oh no, where's my other sheets? OK, I'm going to print one more thing because I have other sheets that are not going to be used-- that are not going to be sent out to the field for intern-- oh OK-- internal analysis sheets. Things that can be useful for me, for the design, for others. You know, if you have a senior engineer or someone, whoever's, doing the load calc or the lighting calc, maybe do lighting designs. Whatever is useful for you, you can have-- how many people are using color fill legends on floor plans? OK, if you're not, take a look at those. They can look something like-- oh, sorry I hit save. Brian, what do you use color fill legends for? I use it for--

**BRIAN JUGE:**

Actually I use it for room finishes when I'm doing schematic design. I'll have all my finishes in there. So what I'm presenting for a client, for a house, kitchen, I already know what the finish in the kitchen is going to be. So I'll have everything ready to go, and then that, in conjunction with my schedule, I can give you take offs. Approximately how much tile, how much wood flooring are you going to have in a project, without drawing a floor. So I'll go in there to demonstrate what that is. Occupancy, occupancy loads, things of that nature. Drop those in.

Again, you don't need to necessarily define every little bit and piece, but I can give you all that information data out there, and it's a very visual thing to do.

**TONY** And they look something like this--sorry-- if you haven't used them yet.

**CRAWFORD:**

**BRIAN JUGE:** On the retail side, you can get out of the box, almost ready to go. Almost ready to go. For BOMA calculation, so you can start looking at client divisions for the different areas. How much is each client going to be using with that. So that becomes a very useful thing out of the box, but I'd say take the time. Get it for your occupancies out there so you can determine your fire separations, things of that nature. That's just a really good investment.

**TONY** I use legends for like air flow detecting. Now we didn't actually finish this, so everything's showing up as yellow. I might not have enough air flow in there. And you can see if I have too much, it shows up in red. Now those are preset values. So if it was a gymnasium, if you had more than [INAUDIBLE] it's probably OK. But, it could be a huge building. [INAUDIBLE] This is customized for this building, for this project, based on the air flow that I had [INAUDIBLE] I never-- OK. Ah! Some of these-- two of these rooms have enough lighting-- or maybe not.

Yeah, it looks like I need more lights in there because I don't have-- everything shows up red. [INAUDIBLE] just to flag for me. Hey, come back and look at this room. You don't have enough lights in there. Or, if it shows up in green, it should be OK, yellow, means you can take a look at that. You can have these set up ahead of time. You can also use them for duct and type legends. Even if you don't use it, you only have to set it up once, and then if it's ever handy, you can use this. And there's so many other things you can have in there. Lighting levels, air flow, occupancy in apartments.

This is-- this one is looking at the room needs. So if that's useful, or if you're doing analysis-- like, I want to know, the kitchen needs different lighting and air flow than the storage area, and the dining area. Even if you just print this out for an engineer, somebody who's never going to touch Revit, hey, look what I have. Look-- is this useful for you? Once you set it up, you don't have to do it again. Were you going to add something?

**BRIAN JUGE:** Oh, just printing out my stuff.

**TONY** OK. So I also have some sheets that I print out-- sheets that I use that are available-- and  
**CRAWFORD:** there's a lot more stuff that you can do-- that can just be useful for internal analysis. I'm never

going to [INAUDIBLE], but it could be useful inside the office. Do you want to switch over to your screen?

**BRIAN JUGE:** Yeah, it's just about done. Well, it's just about done.

**TONY**  
**CRAWFORD:** Other questions, like what would you include in a [INAUDIBLE]? Actually, I'm going to ask you guys while this is printing. Oh, is it done?

**BRIAN JUGE:** Yeah.

**TONY**  
**CRAWFORD:** OK, never mind. I'll ask later. So, switch over to yours. Can I switch to yours?

**BRIAN JUGE:** Yes. So, here's my set. Obviously, I didn't link Tony's in, but I've got the completed building in there, and their color fill legends. So here's my area take offs. I've already got the tenants, how much each one was. That's all out of the box. That's something that we would need to make anyway in there, but I'll have those tenant areas ready to go. You know, the numbering in there, the utilities, and you have different utility areas. So you can start determining, you know, what they're going to be leased on and against in there. So, day one, you just put the grids together and you've got that information and you don't have to go any further. Start the project, put the bays in, hit print. Done. This is how much each general area is going to be in there.

Going inside, putting in-- so we've got some of the views that are already planned, ready to go-- I'll go back and massage this a little bit, but you can already see, there's little different dining areas and stuff that we can start pulling in there. I got my floor in the way inside. So I'd tweak that. I'm starting to get interior shots. So I'm starting to determine what kind of equipment's in there, how much they're going to have inside that view in there, the different furniture plans. So just your sheets-- mainly being the sheets ready to go. Everything is in the background that needs to be. You've got the tags in there, and obviously massaging those around a little bit in the matter of time that we had. Dropped in the restrooms, starting to put that in, getting your calcs in there-- that or on the cover sheet.

So the main takeaway is going to be, kind of planning this out, you know. Even having the details ready to go. Having the out of the box. Linking all those in. So we want to have that time. After you get through your first, second project that should be your template. You should be massaging that. If you want to coordinate correctly, make sure your project base point is

identified before you do anything else. Take five minutes and build that five-minute template. For those who've never done it before, find that project base point, locate it, put it in your project. It will save you so much time later on.

You can't do the, oh, I didn't do that yet. Let me go back and do that, all right? Mechanical guys, and all the rest the guys will know what I'm talking about. Oh, as an architect I'll just move it where it needs to go-- after I've done the building. What happens? Well, it looks great on my end. My building moves, I got it located. What happens to the mechanical guys?

**TONY** What, the base point?

**CRAWFORD:**

**BRIAN JUGE:** The project base point.

**TONY** Do not--

**CRAWFORD:**

**BRIAN JUGE:** Moving it around after we started the project.

**TONY** Please, please don't move that.

**CRAWFORD:**

**BRIAN JUGE:** It's done. You've created so much damage, there's no-- there's very-- you're going to spend so much time correcting that. So have that down. Have that put together.

**TONY** Actually, should we switch over?

**CRAWFORD:**

**BRIAN JUGE:** Oh, just switch over back to yours? OK. So making sure you've got that located in there first thing.

The other thing. Repetitive tasks. You know what? We have interns for a reason. [LAUGHS]

**AUDIENCE:** [LAUGHTER]

**BRIAN JUGE:** I'm going to say it, man. There's repetitive tasks. Have them line up and do that. Have them do all the naming conventions. Have them go in there and build all those little parts in there. That's their job. Use them to do it. OK? Have them tear apart a project that you've already completed. Make that your template. People go, oh, it's so hard to make a template. I don't

have time to do it. You don't, but you had time to build your project. Use that first one. Use that second one. Probably trash the first one because it probably wasn't a great job. But once you get to that third and fourth one, go in there. Reuse it. Make that your template project. Use transfer project standards. Load those families in. Clean out the stuff.

If you're using anything that was there from the very beginning, the Revit out of the box, probably a bad idea. You might want to clean that up. I know I'll tell you right now, that when our firewalls have no fire ratings on them, it really makes it difficult to use for those types of things in there. There's a lot of bad stuff in there. That project base point just kind of-- here somewhere. All those types of things you [INAUDIBLE] the line widths are poor. So take the time to put that together. Really, really, bring that up.

**TONY CRAWFORD:** I was noticing that. In the MEP template, I think the line weights are largely thicker than your line weights. I opened up one of your templates-- or out of the box architecture, and why are all the line weights so thin?

**BRIAN JUGE:** Oh.

**TONY CRAWFORD:** I found that recently.

**BRIAN JUGE:** Start thinking of a way of using your families a little bit different. Nesting the families in there. Building them inside. So I dropped in those big pieces of furniture. Those are super detailed from one of our clients, but they have-- one of them has 40 pieces in it. So I drop in. One family contains 40 pieces.

The other thing is making sure that you have detail levels in there. So when you're in a course detail level, it's just boxes. You can make them real simple so you can move it around and design, and not get bogged down with the geometry of it. If the client really wants a pretty picture, fine. Make that the fine detail. The course detail leave very simple for you to do your work. OK? Clean up those files.

**TONY CRAWFORD:** My clock says we have four minutes.

**BRIAN JUGE:**

**BRIAN JUGE:** No, we're done. We're-- yeah.