DENNIS DIXON: So my name is Dennis Dixon. I grew up in a little small town called Muskoka, up in the Great White North, in Canada. And from there, I built homes with my own bare hands at the age of 13, because I think my dad believed in child labor. I have no idea.

Anyway, so I decided to take it on myself to learn construction and grew up that way, and got into doing a little bit more of the design side. So my dad had a license of AutoCAD version 13 kicking around on his DOS computer, and I decided instead of playing on Reader Rabbit when I was eight years old, I'd draw some lines and create a hockey rink in my basement.

So I got into using AutoCAD and started using it throughout high school. And eventually, when I hit 17, I started teaching it at a local college. So I was like you said, child labor. It's still the same thing.

All right, but moving on through that, a rep from Revit came to our high school, and he showed me this really cool tool that can do some fun stuff. I thought it was a gimmick. I said, I have the Sims at home. I could totally just make that stuff, anyway. It doesn't matter. So I let it pass.

So from that point, I was still doing construction. I decided all right, I'm going to move in and I'm going to start doing design of my own. So I started my own design company, and I've been doing design for about past seven years for custom homes, just on the side, while I'm working during my day job.

After about five years of using AutoCAD in my workflow, Revit really started to get a huge presence. So I was like, OK, well, I can't miss it on that. I've got to be in on that.

So I dove in. I took the time to learn every little bit during the week, so I wasn't losing that efficiency. And because of the fact that I took that little time out of my week to learn Revit, I was able to make a transition into my new projects and make my workflow that much faster.

So keep in mind what's going on up above my head here. I have a preset library of items that is constantly populating, and because of that it's really working away. But let's take a step back. Let's take a look at what's going on.

Today, we're going to be covering a bunch of interesting information. That's a tongue twister. All right, the class is going to be looking through how to change your 2D workflow to something

3D, because it's efficient. Don't be scared, it's not a big scary monster, it is something that's going to help you.

So we're hoping that we can prove something that you guys today. How many of you are using Revit right now? Yes, yes. I don't need to prove anything to you. I love you guys. So in that regard, how many of you are in the residential home business? Awesome. That's a good number. I like it. I don't do good with percentages, so I'm going to guess it's at least 2%.

So let's take a look at some numbers here. In 2014, the US produced $18 trillion worth of gross domestic product. $1.3 trillion of that was construction, and $340 billion of that is generated from residential home construction. It's a pretty big number.

667,000 firms are employing one million of these contractors, and 4.8 million staff. That's insane. And if you take a look at it, the average residential contractor employs fewer than 10 people. So there are a lot of small little mom and pop shops that are trying to do these houses on their own.

And the problem is, is you're dealing with this massive competition of these huge home builders. So it's really tough. It's a very competitive market to get into, and you have to find ways to make yourself truly efficient. So how do we go about doing this? Well, today we're going to definitely show you how.

What are we doing right now? So let's look at a typical workflow. Your typical custom home workflow is to go through design development-- so working with the client-- going to the zoning site plan approval, building permit, and construction.

All right, so let's take a look at design development. Keep in mind, I've got this little counter sticking off the side here. This counter is telling you how much time that you're losing from using a 2D platform. So these hours you can get back from it, and I'll explain later.

So design development, the client comes in, looks at the design office says, hey, I want a new house with a hockey rink in the basement, and a bunch of cool different items. The designer acquires a copy of the site survey, and then from that site survey the concept is hand sketched and translated to AutoCAD line drawings. These line drawings, they then have to go and in hand calculate out all their elevations, all of their swales, all of their information like that, to get a rough elevation plan.

So these CAD plans are used in conjunction with the registered site plan, to be able to

determine bylaw requirements and work out grading. These adjustments are made, and sent for site plan approval.

OK, this number is getting bigger. It's because now we're starting to get into the planning stage. So we're losing 31 hours, just from doing a 2D platform. Let me explain how this works.

The elevations and zoning requirements it may cause the building design intent to change. Change in 2D platforms, very difficult. Allow me to demonstrate.

Sorry, could I use you for a sec, if I can get you to stand up? All right, could you just raise your arm, just one arm, like that? Just stay there. OK.

So this is an elevation. And your [INAUDIBLE]? Yeah, for sure. Just raise one of your arms. Yeah, yeah, just keep it like that. I just need one more, one more, right here. So this is our section. Here, if everybody could stand up, just one arm. OK, perfect.

OK, we just got a change. I need to-- actually, that arm needs to be down to its side. OK, yeah. OK, I got to go back to my section to change it over here, too. Arm down. Sorry, yeah, I got to change it on my elevation, sorry. Oh, man, I can't remember what changes I made.

Now let's take a look at this in something like Revit. All you guys, can you put up your hands. That just happened all at once, just because I pushed a button. This is what a 3D platform like Revit is. Thank you guys, sorry. Give them a hand they were really helpful. Yeah, thanks, guys. I was going to make you guys hold water bottles and stuff, but we'll not get into that.

So basically taking a look at that, when you're working in a 2D environment and you're jumping from plan to plan to plan, it's very time exhaustive to be able to have to make those same changes over and over and over again in your sections, elevations, plans. And that's where the time loss is coming in.

So once we get past the site plan approval process, the building goes forward with construction and permit drawings. OK, construction I put an XX beside there, because these hours can go on forever. You can get all kinds of mistakes. And the reason for that is two dimensional drawings are really put to the test, because on site alterations happen frequently due to unknown headroom issues, mechanical issues, all those kind of things.

Residential home builders out there, how many times have you had to replace stairs because of a structural component? You had to do that? I guarantee you had, because there's

something going on in the headroom issues that you didn't see in a 2D drawing. You're really relying on your drafters to know what they're talking about. You should, anyway. I mean, you don't want to hire just some random person. You could, but anyway--

Management of late change orders is paper based, or Microsoft Explorer. So a lot of that stuff gets a little bit taken back.

All right, let's take a look at that. So I've said a whole bunch of stuff, flapped my little mouth around, and said a whole bunch of words. But what do we do? Well, it's this right here, this Revit thing a lot of you guys are using. That's exactly what we're going to do.

So we're going to get into it. We're going to get into the meat and bones. I talked about a whole bunch of stuff. Now, I'm just going to leave this video playing up on the side here. I'm just going to move it. But let's get into her.

All right, this is your Revit template. A lot of you guys are pretty comfortable with it, I imagine. For those of you that aren't, there's a few things we need to go over. A Revit template is the cause of 90% of being efficient. So 90% of your efficiencies come from a solid template. And I'm going to show you guys how to put one together today that'll really make your workflow go really well.

OK, so take a look at the template I have here. Your views are set up in a way that it's going to continue with your phasing. So if you've phased your project accordingly-- let's say your site plan approval, your drafting table for all of your crazy sketch designs, your building permits stage. And then everything is the exact same on your sheets, so your site plan approval sheets, your building permit sheets. And when it's organized like this, you can very quickly be able to see how it's being put together. So let's take a look at site plan approval.

So everything's already populated on a sheet. That makes things a lot faster. If you're taking a look at this, any design that I do on these floor plans is going to populate itself on every one of those views at the same time. I don't have to think about placing my views on sheets. They're already there. So when you're going in and doing a slight change, like let's add a random wall in our floor plan and I go onto my sheet, I have a wall showing up on my site context plan, I have a wall showing up on my first floor plan, in a specific color that was provided to me in my site plan approval process. And then the same thing. I got my first floor plan set up. All my walls are showing up their accordingly.

So if you have your template set up, you're not constantly thinking about having to place views somewhere, or constantly having to think about scale. You're not having to think about all these different little things that add to your process, because it's happening in the background.

All right, so let's take a little bit further look into this. Each of these little views have their own view templates. These view templates control specific items, like the scale, what overrides are being done in those drawings. And because of that, we're able to organize them and make sure that all of our plans look the same.

Now, there's another hidden thing in here called the scope box. The scope box allows us to make it so that all of our views are cut the exact same way, so that they all show up at the same exterior look on every sheet. So your levels, your grids, all of those items look identical, no matter what sheet you go to. Very important, very, very important.

OK, all right, and now I'm going to get into the really fun stuff. Sorry, I'm going to get really happy about this. I really love this stuff. All right, back to it.

To go further into our template additions here, I keep an admin folder. Now, this admin folder allows you to be able to organize your families. So let's say these system families like your walls, your floors, or roofs, everything like that, take a look at it here. It's got this amazing structure of items that we have in our project. So we keep this little dump file in the background, where we can drop all of our different masonry on wood stud walls, side on wood stud walls, CMU, EIFS, all the way down to all the different floor types, ceilings, roofs, wood stairs-- but you'll notice that these objects don't show up in the rest of our drawing. The way that we control that is by using phasing.

So each of these objects are created in a phase that are existing, way beyond, way before existing, and are demolished right after it. So if you take a look at it, they will never show up in this existing one, or in the new construction phase. They'll be somewhere way in the background, that'll just be hidden. So you can draw over top of it all day long. You can have a huge heyday. It'll be so much fun. Anyway--

And you can hide all kinds of information in here to really mess with your BIM manager. I'm just kidding, don't do that. But you might want to. Just take a picture for me.

All right, so those are Family Library. You can really keep track of all this information. And when I say keep track of this information, take note that every single one of these components

have information built into it. So the wall tags, the tag information, the thermal values, the cost values, all those sort of things are embedded into it.

Look at that drawing. That's really starting to populate, isn't it? What is that running, 15 minutes? Can you Imagine being at that level, working in a 2D platform? Just saying. OK, carrying on.

Let's take a look at schedules, too. So have your schedules pre set up, so that all the information that's in them, your door schedules, window schedules, wall material takeoffs, plumbing fixture schedules, all that stuff are being live populated. Don't set these up after the fact. You can have it set up in your template so that it's working one to one. It's working constantly.

OK, so with those schedules we'll take a look further into this little workflow here. Let's just go to a plan view here. And keep in mind, at the end of the presentation I'm going to show you guys some really quick ways to do iterative design, so to do a really quick design using Dynamo. So if you stay at the end, I'm, going to show you a cool little Dynamo script that was written up, if you're interest in that. How many of you guys are interested in that? Oh, that's good. I like hands. Hands are great.

So I'm going to do a couple more things where I get to make you guys stand up and do funny things. I'm just kidding, I'm not going to do that.

So back to our drafting table. From here, when I draw a wall-- so that wall that I drew here, take a look at the schedule that populated.

So already, just from that one wall being drawn on this sheet, it's pulled out the material area for every object within there. So I've been able to extract the masonry, and all these items from in there. There's another wall sitting in my project that's off to the side that I picked up in here, as well. But if you take a look at, it's giving you a cost per square foot. Ignore those values. They probably don't seem right, but just showing you how it works. And then from there, being able to break it down.

Not only is it doing that, but it's all also taking my sheathing quantities. So I can break down the sheathing exterior walls into the number of sheets, by using my material area. And it's giving me a total cut off of the value for each of these on there. So this is what I'm saying. Set up these schedules ahead of time, and then these schedules will be able to populate later on,

right down to all the nitty gritty stuff that you really love.

Are there any questions about schedules? I'm really open for schedules.

AUDIENCE: [INAUDIBLE] one quick thought.

DENNIS DIXON: Sure.

AUDIENCE: If you have those multiple [INAUDIBLE], identify who your project [INAUDIBLE] on schedule.

DENNIS DIXON: Yep. So they're all pre-defined. So every little bit of information that you put in there, your cost per square foot, all that jazz, the material-- sorry, go ahead.

AUDIENCE: You had that one view where you had the wall set, the walls, the floors, the [INAUDIBLE]. How do you keep that from modeling to--

DENNIS DIXON: Yeah, that's a good question. So when you go into the schedule, remember the phasing that we set up? It's only going to pick up items that were placed in new construction. So it'll leave anything that's in those past phases alone. That's a good question. I love that. More of those, please. Awesome.

So going back to those schedules, the exact same thing that you were saying, it'll only pick up any new walls drawn in new construction. It's a great way to set it up.

Wow, oh, take a look at what's happening over here. We've got a house. We've got a house, people. 18 minutes.

OK, so continuing on, let's go to our first floor plan. Let's add some extra value to this. Let's go add in a window. Let's add in a different size window. Sure, let's add in a door. Entrance door. Let's add in another wall, and let's say, drywall on both sides. Some more doors, why not? Let's see what's happening.

Take a notice of what I'm using here. I'm using Pella windows and doors. You can actually download manufacturer windows or doors right off of their website. So keep in mind that more and more manufacturers are producing BIM families constantly.

So let's go back to our scheduling sheet here. Take a look at what happened. So my door schedule is doing a live count of every bit of information that I have in there. It's got my rough width, rough heights, fire rating, even the cost breakdown for each of my items. So you can

start doing preliminary cost calculations for your project, right off the bat.

So you can tell your client, OK, well, it's going to be roughly this for your windows and doors. You can start doing that for kitchen cabinetry, and all that information. Let's say plumbing fixtures-- so if we were to add in components such as let's say a toilet, a tub, let's say, maybe even a sink. Now, that's not a bathroom I would design, but hey, if you're into it, awesome. Right in your living room, right? Perfect.

All right, so taking a look at that. Same thing. It's picking up the values of these items in your project, breaking it down by cost and quantity. You can even take this plumbing fixture schedule and plug it in for the city, because the city needs to know how many extra features you're adding in.

How many people would use this? Yeah, I'm seeing some good hands. They're the really down here. Next time, we'll try and go way up here. Yeah. Don't be shy. Don't be shy, I won't call you out. It's only partially true.

OK, so looking further into that, we have all of these wall types. Set up we have all of these items driven in our template. Just give me a second here, guys. So I'm closing up some information.

So now that we've got it to a point where we've got our design looking the way it needs to be, we need to start thinking about detailing. And this is where people tend to gravitate away from Revit and go back to their AutoCAD ways. Don't be scared. Revit can do everything the same way AutoCAD can. It can. Do not be scared. It is so easy to do.

All right, allow me to show you. Let's take a look at some detailing here. So we have add a section, I've drawn basically are just a wall, place A window in it, I have a floor, and then another floor.

So when you start thinking in boots doing sections and doing details, start thinking in your head, OK, I have this one item that I can use. This one item might be a stud, or some sort of anchored connection, let's say, something like that.

Well, that's all nice, but what happens if I have multiple levels and I have lots of information that I need to add in? So let's create a small little rim joists detail at the bottom.

OK, well, we know that this is going to be the same top plate set up for most other things. So

why don't we add a top plate into this, as well?

OK, but OK, let's say we add on second floor? So we want to be able to turn on and off a second floor value. So we have these detail items that we can now move around.

So what happens if I add in a window? Well, you can get in there to start adding in details for a window, and for a brick ledge, and for all these other information. This family can go nonstop. I literally had to stop myself and put a leash, because I would have just gone crazy, and created all this other stuff-- a super family, so to speak.

But if we take a look at this and creating repeating detail components, where you can do, say, TJI joists, and you can place them along a certain object tab button tab. Use that Tab button. So taking a look at repeating objects, where you can get into doing TJIs, or studs, or I don't know. Or you can put your [INAUDIBLE] pie on there and copy it a bunch of times. It's really up to you.

And then taking that same concept and doing items like let's say, brick. Looking at brick sections, as well, where you're able to copy up and quickly manipulate items on the fly.

So that's all nice. You can populate this information fairly quick with insulation, and get everything in there and add in all your values, but I'm not going to draw a detail for you completely right now. But I'm going to show you something else.

One of the tools that are widely ignored and shouldn't be are keynotes. Keynotes are great. Keynotes are really awesome.

Sorry, I just want to take a little quick break, since we're at this at this part of the video. Personally, I use this Lumion Pro to do renderings. I love this program. It is great, if you're doing any sort of architectural visualization. It's kind of a shameless plug for me. I really love it. But if you take a look at how long it takes to set up a rendering, it's very crazy, and a lot of fun to use. So that'll keep happening on the side.

All right, so moving on here. Keynotes. It is so important to use these. Take a look at what's happening. I have material keynotes split up for almost every object I have in Revit.

So when you take a look at what it's picking out, it's picking up, say, half inch gypsum wallboard, or two by six framing at 16 inches, or one inch rigid insulation. Standard brick, half inch joint. So you can see all this information is being populated.

You can even do specific elements, or specific assemblies. These specific assemblies can be called out for you ULC. They can be called out for master format. They can be called for all different types of things. Because if you take a look at, if I was to tag something that didn't quite fit in, let's say something like that, you can pick up using your master format, or even just these keynotes Imperial from Autodesk, that it provided nicely for you. You can go down and break down and find out exactly what it is, plug it into your keynote, and use it later on.

So this should be set up in your template. If it's set up, dimensioning, and tagging, and placing information is going could be so fast for you. Hey, look what I'm doing, something that's not great. All right.

So that's pretty cool, right? You guys really want to start using that, right? Yeah, I see a lot of heads nodding. You definitely want to do that.

OK, so residential homes, and specifically residential homes in Revit are really, really fast. They are really awesome, and there are a lot of tools involved that can make your workflows so much better.

How many of you worked with that residential home sloped roofs? Worked with sloped roofs? Yeah. That's what I was looking for.

So this is one of the other reasons why Revit tends to shine, because the roof calculation tool is something that people just love to grasp onto. If we go up to a second floor here-- and I'm going to put a roof on of my little building, because it's fun. I like to show little tips and tricks of stuff that people may or may not know about Revit. There is a little trick in here, which I will show you guys because I'm feeling generous today. I think you guys have been very attentive, and I would say 90% of you are still here, so I think I'm doing something OK.

All right. Let's take a look. If you want to add a dormer onto the front of your building, there is a neat little trick that you can do to do that. So by using these little slope arrows that I have here-- so what I did is I split this up into two lines, and was able to add these slope arrows. Little bit of a segue, but we'll survive.

And then I'm telling these to not define slope. So split it up into two separate lines, told them not to define slope. And then using these slope arrows, I told them to point towards each other. So you can see from them, right now I've got 10 feet to the peak. That's ridiculous it's going to look like a church. We got it.

So if I hit my check mark, take a look at what's happening. So an embedded dormer. How many of you guys had to create these little dormers in the past, you had to create a separate roof and join it in? Yeah, a lot. So just that one little trick is going to save you guys some time.

You can get a little bit of applause for that, right? I don't know. Do we do applause here? Yeah, OK. That's good. Tips and tricks.

Another little out fancy trick that I wanted to show you, and we'll just take a second to look at what has been created is 30 minutes have gone by, and what we've seen on the side here is in 30 minutes we've had a floor plan that was drawn just purely off of an image from Google. It's been populated in a 3D environment. We've taken it, plugged it into a software, such as Lumion.

You can do the same thing in Revit. You can place RPCs, do whatever, and then do a retrace of it. But in just 30 minutes-- and I was a little groggy, I didn't have my coffee that day, so it was pretty slow. But you were able to create a fully rendered realization of your building, very quickly. That's super invaluable for the smaller companies who are doing custom homes.

You can bring that home, take a picture of it, show your grandma. It's great. All right.

Another little trick I wanted to show you guys, just because I'm in the mood of showing tricks today. How many of you have had to show the dashed lines of information above, but have been drawing it in, just in 2D detail lines? I see a bunch of hands starting to form up. There we go. All right.

So if we have a roof detail sitting above, just using your Pick Lines tool, from your Modiy Tab, or your Line Work tool. You can click on Hidden, or whatever line type it is you want. Place it. And then you can turn off your underlay.

So take a look at what happens. These lines still exist on this floor plan, and you can even edit your roof from this these lines that show up. So regardless of what happens, if I edit this roof and change its dimensional properties in any way or form, those lines will adjust themselves accordingly. They will always stay on your floor plan. That's pretty awesome, and that's something that they don't teach you at home. If they did teach you at home, then there's some other issues that we need to talk about, but OK.

So we've taken a look at this template, and we've gone through how valuable this information

can be. So from those sheets and looking at how the schedules are set up, looking at how your views are picking up all this information, now, that's art. That is art.

But like I said, fill up this stuff with as much information as possible. Do not be lazy and draw a 2D line work. Please do not be lazy. It will really help you out.

So that's all dandy. Once we have our template set up, we can go off to the races, as you saw with the drawings that were happening there. Once you have it going, we can now start getting into annotations, where we can start placing annotations very quickly.

So if you've got all your wall types, your door types set up, we can now go to say, for instance, a Tag All command. We can tag everything all at once-- our door tags, wall tags, window tags, whatever we want. And it'll populate all that information right off the bat.

And you'll see-- whoa, look how much stuff I've got open. All right.

Anyway, you'll see that it matches up with the type marks available in your door schedule, so my W1's, W2's, everything like that. W1, W2, all that information's there. Even wall tags, where I want to get into doing a Tag All, with my wall tags. Add a leader, boom.

So same thing. Why would I ever waste time trying to tag everything individually? You can do that.

So taking this to a whole other level, we have been able use software like Dynamo to really push this to its limits. Dynamo's been kind of a hot topic lately, because it allows you to really drive your software. This is great. So we can draw our homes quickly in a 3D platform.

If you're using 2D right now to do your designs and do your work flows, please think about what you're doing. It's taking too much time. So use something like this to get going, and then you will start to see the benefits and the return on investment come back.

So I'm going to delete all this, and I'm going to show you guys something just a little bit of a treat for the rest of you.

All right, are you guys ready for this? You guys like Dynamo? This is awesome, awesome, perfect.

So what I've created-- and I just did this a night or two ago, when I was sitting in my hotel room. I was like, this would be fun to show. I wonder if we can create a house just by drawing

a few lines. What? Yeah, you guys just all went super quiet. You were quiet already. OK, here we go.

All right, so let's say we had a random design, drawing in a bunch of lines. Sure. That looks awesome. Do you want more complexity? We can add some more complexity. I could add angles on there too, if I want, but I'm not feeling that cheeky.

All right, so let's take a look in our Add Ins here. So I've got version 0.9 for Dynamo, the new release. Let's take a look at what's going on.

So I've got to set to manual, so it doesn't do any crazy stuff. So I've organized it accordingly.

So what this is going to do, if you take a look at it, it's picking out a specific wall type from my list. Using that, I can tell it which level to place on, and using the information that's shown here. And I'll stop in little intervals here, so that when you do you get this video that comes out on the 4th, you'll be able to recreate this yourselves. It's completely yours. It's like Oprah Winfrey Show, we're just handing out gifts, throwing stuff around. Here we go.

So I will make this available to you guys to play around with. And in a couple weeks, I should have an entire house drawn in here so that you guys can use a Dynamo script that can create a house on the fly.

So currently it's creating the first floor walls. It's also creating the basement walls. It's creating the first floor, the basement slab. And it's creating all of that purely by a set of lines.

On top of that, we can even take our topography and we can create our topography according to a property line. So we can extract that curve, the property line from Revit, and then by using that create a topography by points.

So what we're going to do is just by using this simple little node here-- now I'm crossing my fingers, because Dynamo does some funny stuff-- but I'm selecting these lines here. You'll see that they're all populated. Now, don't throw stuff at me. I'm not very quick in dodging. So here we go.

That's pretty slick. That's pretty slick. Now, if you take a look at that in 3D, you'll see that it's populated all the walls on my main floor. Its placed the floors. It's placed the slabs where I want them to go, and all that information that we see there. Is that pretty awesome, guys? That pretty awesome? Yeah, thanks.

So imagine designing a subdivision where you have a number of different types of houses that you have going up, bungalows, second stories, and a whole bunch and that you have to do really quick, just for iterative design. Instead of massing it out, you can just draw your line work on a site plan and have like a rookie Revit user that's only used it for two hours. Have him just draw a bunch of lines on your site plan, and then afterwards just run a Dynamo script to place all of them at once.

AUDIENCE: Can you design that [INAUDIBLE]?

DENNIS DIXON: Say again, sorry?

AUDIENCE: Can you design that script to room separator lines? [INAUDIBLE].

DENNIS DIXON: I don't know why you couldn't.

So the question was, can we assign that script to room separator lines? Question is, is yes. So room separation lines are a type of line. If it can call it out in Revit, you could do anything with it. So any type of line, an edge, a CAD file, anything that has line work in it, you can do with this. So that's a good question. Are there any other questions about this?

AUDIENCE: What was the name of that?

DENNIS DIXON: Dynamo.

AUDIENCE: No, the name of the script.

DENNIS DIXON: Oh, the name of the script. It's called customhome.dyn, but I will post it up after this class.

AUDIENCE: What's the price of the software?

DENNIS DIXON: The price of the software? We can talk after, if you want to get into something like that. But the Dynamo actually comes with Revit, so we can look into that after. Perfect.

We got any other crazy questions? I know you guys are interested in this. Perfect.

OK, so adding further into that script, just started into making the [? fascia, ?] and then the roof will be populated. Then we can do all kinds of crazy things, getting into cornices and foundation footings, pads calculated according to width. So you can get an entire structural

plan sorted out for a house, just by a few clicks of a button.

So the greatest part about that is you can select and then run your Dynamo script, and then you can run across the street and go grab a beer while your guys are working. So that's pretty awesome.

So another thing I wanted to show you-- and a lot of people aren't using this-- this is super key. So one of the points that I brought up earlier about site plan approval and doing site plans, when a surveyor goes out to get information, they typically have a CSV file or an Excel file filled with points that they've acquired. Now, some surveyors take those points and put them into 3D data on their CAD files, and that 3D data can then be used to populate basically your entire grading.

So within Revit, you have the ability to take that CAD file according to its points, and drape Revit topography right over top of it. So I don't know why people aren't using this. The surveyors have the points available, and you can extract it from CSV.

So let me just blow this up for a second here-- like not literally, but we'll blow this up. Here we go.

So I'm going to go back to my first floor plan here. In fact, why don't we go to my site plan? All right, so I just received a CAD file. It could be from CSV points or a CAD file, it doesn't matter. I'm going to insert and link this CAD file into my project.

I'm going to set it up so that my origins are the same, and I'm going to bring it in. So I extracted the contours from another file and brought it in. If you take a look at it in 3D, it's basically taking those contours. You can see AutoCAD 2D line work just extruded up.

So what happens. When I go into my Massing and Site tab in here, when I use the Topo Surface command, it has an option here called Create From Import. So remember all that time that you've been calculating elevation points according to first floor, or according to your top or foundation? You have to sit there and go, OK, well, this geodetic minus this geodetic is this height, and this geodetic is this height. Oh, I forgot the slope. And it keeps going that way.

The surveyor's done the work already. Do not redraft. Redrafting's bad.

So taking a look at this, I'm going to select my import instance. Just going to click on the CAD file, and I'm going to hit OK. Yeah, you can applaud for that. That's awesome, yeah. Perfect.

So like I said, extract the information from your surveyor. Right under Create from Import is a Specified Points file. So these point files, as you can see, are a CSV. Do not waste time doing that. The surveyor has to have those points. It's part of their project. And I keep on hearing this constantly, my CAD file is just raw 2D data that doesn't have anything. Well, ask them right away. Do you have an Excel file with the points in it that I can have? Do not hand draft these topographies by yourself. You're going to waste yourselves a lot of time.

Do we have any questions about that? I usually get questions regarding site plan. Yeah.

AUDIENCE: Can you do that with [INAUDIBLE] 3D files?

DENNIS DIXON: I'd imagine you could, depending on-- we might have to export them out as a DWG, but I'd imagine so. Let me look into that for you.

AUDIENCE: [INAUDIBLE].

DENNIS DIXON: What's that?

AUDIENCE: Can it export the DWG [INAUDIBLE]?

DENNIS DIXON: Yep. Exactly. Any others? Pretty quiet in the back, there. You can yell, if you want. It's up to you. Perfect.

OK, so looking into that we have this Dynamo script that I showed you, is this really big treat. Sorry, I'm bumping my mic around here. We showed you a really Revit roof tool, showed you how to do so detailing. Take into mind--

So when you're doing detailing and you're doing certain objects, think about how you can make it work for multiple things. Do not think about a stud as just one little stud item, like a block that you can place in certain items.

Think about a stud that can be used in the header, and that header detail can be used somewhere else. How about placing a header directly in the window family, so that the window family has the header built into it? Then you can choose different sizes. On top of that, you can even build in detail items so that your window is showing your beam or you're lintel above the window in your floor plan, with all of the tagged information according to it right there. So imagine all that time you're saving.

You can have it set up so that it changes according to wall size. So start thinking about making smart families for your project. Think about making your template set up really organized. This is going to save you so much time in the long run, and it's going to really help you out. So schedules are important. Key notes are important. And then getting into the really finite stuff is really important, as well.

So with that being said, I don't have much more to add into this. But I am willing to talk to you guys and help set up template information. You guys all have my contact information. It's ddixon@ran.com. And if you need to get a hold of me, I have a whole bunch of tips and tricks that are going to help you guys out. And not just for residential homes-- it's lots of stuff for multi residential, for commercial, for all different types of information. Feel free to contact me. I love helping. It's going to be a lot of fun.

So with that adieu, that's pretty much the end of my presentation. I'm open for questions now. So if you have anything, come up and see me. Yeah, what have we got?

AUDIENCE: You mentioned earlier about making a batch for specific items, and [INAUDIBLE] those. Are we getting to the point where I can go to Lowe's department store and find an architectural column, or something that has all the dimensions, all-- I could [INAUDIBLE].

DENNIS DIXON: Yeah, a lot of that is actually happening. So the question we had is, can I find manufacturing items like preset columns and stuff from Home Depot? A lot of people are making them. And that like for instance, there's an electrical manufacturing company that was debating going into a BIM environment. They wanted to basically know if it was worthwhile for them to create BIM families for MEP. So we put them in contact with an MEP consultant, and that MEP consultant told them yes. You know how much that would help us if we can just grab those families off there? And right away, they dove right in and they started making electrical panels, outlets, conduits, everything like that. So it's happening everywhere.

So if you took a look at seek.autodesk.com, back in 2012, 2013, there were probably close to maybe about 25,000 to 30,000 objects. This year, there's almost 70,000. So you can see how that's really increasing. And this time next year, due to inflation you're going to see it up in the hundreds, 200s, and they're gearing it towards facilities management.

So other questions? I saw a hand. Yep? What do we got?

AUDIENCE: [INAUDIBLE] scaled point [INAUDIBLE].

DENNIS DIXON: With point cloud?

AUDIENCE: Scanned the point cloud.

DENNIS DIXON: Yeah, there is a point cloud out in there that we can use. We can drag it that information. That's a really good question, because I've been meaning to get into that one soon, too. At [? Imagina ?] Technologies we host a Dynamo course, so if you're interested we can look into something like that. Perfect.

AUDIENCE: Is that an online [INAUDIBLE]?

DENNIS DIXON: There is an online course, yes. Yep, exactly.

Sorry, light's in my eyes. Do we have any other questions here?

AUDIENCE: What's the name of the rendering program you used?

DENNIS DIXON: Lumion. They're actually here, at Autodesk. They

AUDIENCE: [INAUDIBLE]

DENNIS DIXON: Yep, they're are all the way in the back. So and I think actually one of the Lumion reps was here, watching the presentation somewhere. But he might have eluded and escaped, so perfect.

Yeah, the Lumion's great. Revit does have its own ray tracing capabilities, to create the photo realistic views. It is great. There are Cloud Credits available, and you can use that, as well.

Yeah, so that's it. Feel free to come up if you like, and thank you very much for paying attention. Thank you.