SPEAKER: So I did want to start off talking about this class because it is called Handrail Hacks, but it is going to be the basic properties of handrails and how we can utilize those to benefit it. So if you want to get up and leave because you think you know everything about the handrail properties, feel free. I thought I did when I started researching this, and I realized, holy crap, I was clueless.

So if you want to get up and leave, I just want you to know that. So I'm not going to get into adaptive components. I'm not going to do crazy things with handrails. I'm going to truly dig into the properties of the handrails and see how we can use them. So like I said, to me I thought it was kind of crazy when I got into this. So learning objectives, it's mandated. There you go. All right.

So the biggest thing-- and I'll apologize. I'm going to be coughing on you guys. Sorry for you on the front row. You're going to get sick probably. I got sick over the weekend, so--

The biggest thing for me when I started digging into handrails was looking at the terminology and everything that made up a handrail. And I had no clue that's the long laundry list. You can see the bold text is actually families or nested families, and then you've got all the properties that go to those settings.

So I was actually kind of dumbfounded, just over-convoluted wow. There is nested families inside of nested assemblies inside of assemblies, which kind of blew me away. So I try to use proper terminology because we call it railings. I try to say railing, not handrail because there is a subset of railings that are called handrails. So I always try to use the proper terminology, but I guarantee I will screw that up at some point in time.

So I'm going to get into some of the very simple things partially because I show this, and a lot of people don't even know some of these simple tools exist or what they actually do. And you're going to find out I'm not a PowerPoint user, so I'm going to be bouncing back and forth quite often.

And I also always like my sessions to be very open, so if you have a question, ask it when I'm there because I will remember what I said 20 minutes ago, especially in cold medicine. So if you see something I'm doing and you have a question, raise your hand, and ask it. And if I don't repeat the question, somebody up here throw something at me to repeat the question

because I'm terrible at doing that.

So a couple things I just wanted to get into I'm not going to spend too much time on this, but I like to show the differences of why this is there and what's going on. Now when you go to place a railing, you have two options-- sketch path and place on host. Well, the place on host option is only there for a stair or a ramp that does not have any handrails, really stupid.

You're like, oh, new 2017 feature? I can host it to roofs, walls, and floors. But you can't use that feature to do it. Makes complete sense, right? I honestly do not know what this tool was, so if I go draw a stair. And I'm going to put a stair in here, and I'm going to finish the stair. If I go to place railing on that stair and I say placed-on-host, it will not let me do it because this stair happens to have handrails already associated to it.

So if I just come down here and say, OK, there's the railings. Let me say OK and delete those two railings. Now when I say railing place-on-host, it'll let me put it on that stair. So that future only works with stairs and ramps if they do not have a handrail associated to them.

Otherwise if you did have handrails-- and I'm going to undo the delete. If you do have handrails associated to that stair and you want to put it on there, you have to go into sketch path. And then choose pick new host. A new feature to 2017-- if you guys did not know this, we can place handrails on roofs, and slope floors, and walls.

So don't know if-- anybody need to do crazy wall caps when you've got a wall going like this, and you need to do something on roof. And in the past, we've had to do in place sweeps to do that. Do it as handrail. It'll follow the topography of the shape of the top of the roof or the wall.

I've also seen a lot of people who do roofs or floors for curbs and gutters. Now you can do a handrail to follow that floor to get your curb.

AUDIENCE: That's going to follow the terrain or something?

SPEAKER: No, but you must be on the beta form that we're not supposed to talk about. So no, it does not follow terrain. I didn't say that. I'm just answering the question, not my NDA.

So you can say pick new host and then once you say pick new host again, the other thing that's weird to me is it does now say such as a floor, stair, or railing, but it does not say a wall on the tool tip. So just to let you know, go back and play with that. It can also be a roof. So go back and play with that tool because it only says floors, ramps, or stairs, which was the old

theory. In 2017 we can now host it to other objects. So that's my basics.

The other thing that I have at the very opening slide that most people don't know, and I'm not going to host this to a stair, or a ramp, or a rail. I'm going to do four segments here, right. So I've got four sketch segments. A lot of people do not know that when you grab a sketch line it has properties on the Options bar. So everybody looked at that? Yeah? Anybody use this feature? The first old Revit users, before MEP was out when we had the model cable tray or conduit, this is a great tool we used all the time.

So I'm going to grab one of these sketch lines. And I'm going to take this one sketch line right here, and I'm going change the height correction. You can do this if it's hosted to a stair rail, and if we have a stair where it kind of freaks out on landing, sometimes goes do a weird stupid height. Well, you can change that just by using the height correction.

So I'm just going to come in here and throw a value from custom. I'm going to throw up at a distance. I'm going to say two feet, might have been two inches. I'm not sure. And I'm going to get rid of this crazy handrail. I'm looking for one that is the rail only. So if I now go to my 3D view to look at that one handrail, which is now over here, you can see what happened. So one sketch line, I'm just playing with the sketch properties of that object.

The other cool part about this is if I go edit that path and I take this other sketch path that's next to it, rather than it being sloping by the host, I can tell it to be sloped. And now when I finish I've created a rail that follows up and down.

Last year when I did this presentation, that's how I showed it following a wall that went up and down. But since we can host the walls this year, I no longer need to use that. So I don't use this feature often, but it is a feature that does come into play that most people don't know about. So I'm going to go back to my PowerPoint.

So that's just some of the tips in there. And has anybody here ever had the issue of you do a handrail and on the landing, the handrail sloping up?

AUDIENCE: Yes.

SPEAKER: Right, that's your fix. Go flat. So you select that sketch line, you hit the drop down, and you say flat, not by host. You can only do a single sketch at a time, which is a real pain in the ass.

So if I've got a landing, and both ramps are doing it, I have to grab one sketch line, the other

sketch line, and say flat. You cannot do that option with more than one sketch selected.

There's also an option in there which I did not do, because I forgot. I don't use it too often. But you can change the rail joins in a sketch line. So if I grab two sketch lines it'll come up and say rail join, where I can add the vertical segment if it's not there. And there are some other options.

So play with that one if you need to. Those aren't features I use often except for the go flat part on those screwy landings. We've all had that issue? Yes, no? OK.

So, hosted railings. I kind of covered that a little bit. You can see my screen captures here. This is a new 2017 feature. The one thing I will point out on this is, if I am hosting a railing to a roof or to that wall, right here on the left where you see it come off flat, as well as on the right where it comes off flat right here, you have to have a split in your sketch line.

So if you try to go host this to a curved wall like that, it'll just continue curving down if you do not split that sketch line. So split the sketch line. Same thing on the roof. If you're going over the roof and then off to the side, and you want it to be flat after the roof, you've got to break the sketch line there for that to happen.

So anybody want me to show that? Yes, no? Yes. Cool. Like I said, interactive. If you want to see something, say show it, and I'll show it.

So, I am going to come in here with the back of the floor plan. It'll be a little bit easier. I'll draw a wall. I'll draw it right under this rail I already did. I haven't honestly done the height correction and sloping under edited paths, so this will be new for me.

So, wall. I'm just going to draw this wall right here. I'm in the wall command, all right, basic wall, sure. I'm going to take that wall. Then I'm going to edit this handrail. I'll nudge it up a little bit.

And I'm going to say Pick New Host, Pick The Wall. And theoretically I should be seeing it on the top of the wall. Why did that not happen? Oh, it did.

So now if I come in here and just edit the profile of this wall-- we'll delete that. We'll make it curved. We'll do something a little bit fun. We'll go straight. Then we'll go curved.

I should have turned chain on, but, oh, well. Too late now. Does everybody know that you can

actually set the chain options in your INI file in Revit? So now when I finish that, I was-- this is really, really screwy because I broke those.

Let's go back and say Reset The Railing. I don't know if that fixes-- yeah, it doesn't. So let me go out of the path. Let me switch these back.

Actually, you know know what? I will just delete these lines, and I'll make this one longer. And I'll make it a lot longer than the wall, or at least a bit longer. Go away. Finish. Boom.

And the cool part is, like I said, if I come back here and edit the profile of the wall again, and maybe I just delete this and trim this out, then I can come in here, ooh, that curve's not big enough. I can delete the curve, do another curve. Sure, that looks great. Trim that out. It will again pick up on what that wall is doing.

But it will not go straight right here. So if you want that segment to go straight, again, you've then got to go in and put a split in that sketch line of that rail, right at the end of the wall. So if I edit the path, split it here, roughly. Say Finish. Now that still didn't go straight.

So, again, that's where that new tip might come in, that I didn't know I would need to do. Say no, Go Flat. So I guess that new flat feature might even be a bigger deal. Hey, we all learn something every day, right?

AUDIENCE: Yep.

PRESENTER: OK, so that's one of the new features. Very similar if you're hosting it to a roof, as well. And somebody else mentioned topography. No, we can't do that yet-- today, I should say. So, did that. We're good. Oh, yeah, that was only a 2017 feature, by the way, on the walls and the roofs. So if you're in 16, upgrade.

OK, so, kind of getting into the properties of handrails-- excuse me, see, I use the wrong term-- of railings. So when you start looking at railings, there is a lot of properties that happen in here. And anybody who's used Revit prior to 2013, the handrail one and two, and the top rail is something completely new. There are still features that you can take advantage of just using the rail structure and the baluster placement, and I want to talk about some of those to get started with.

So, it gets really confusing because in Revit-- and I'm going to start out of the box, so you guys aren't seeing anything crazy, Emeril Lagasse stuff here, right? We are in Vegas. He has

restaurants in this building. When I go to do a handrail-- a railing-- and I'm just going to grab the rectangular rail here, and we just go decide to look at the type properties of that.

This out of the box rail is using a top rail here. So this was a new feature in 2013. And if you have 2,017.1, there's a slight change to this. 17.1 users, OK. If you guys haven't heard, don't hit the Dynamo Player button. Talk to Aaron Maller on that one. It actually breaks Revit.

So, in 2017.1, there is a new feature up here called Use Top Rail. That was there in 17.1, because before in the past, we had a drop down list here. And all we could do was change to a new type. But if we wanted to edit that type, it sucked. We had to go find it in the project browser.

This was a long requested item. We can now hit this browse button to go browse through the type properties of the nested top rail that's part of this railing. So that's a nice new feature. That's a 17.1 feature that we've been requesting since 2013. So that's a great feature that we actually have inside of here to go do this.

But what I want to talk about is the old school stuff, balusters. Who's gotten into this dialog box before? Playing with balusters? Who's been confused in the dialog box before, playing with balusters, is that right? And if you haven't gotten this dialogue box yet, you will be confused.

So the one thing that I like to point out that a lot of people don't know-- and I'm going to talk about patterns up here a second-- but a lot of people don't ever pay attention to this little area down here, the break pattern and the justification. So there's this one tip that I always talk about. There is one option in here to break patterns at. And the default comes up with-- the one they have is at each segment end.

So basically, if I'm telling Revit to give me handrail-- a baluster every two feet and the segment ends, it'll start over and go another two feet. So I could end up with one six inches away, and then the next one two feet away from that because it's breaking at each segment. So you can tell Revit to just say, and break it at each segment end, never break it. So continually go two feet along the length of the path.

So don't consider each break in the sketch line a segment. Just consider it all one length and go two feet from there. So that's a feature that a lot of people don't know, and that actually answers a lot of questions people have. You can also say break if the angle is greater than. So if it's an angle greater than 45 degrees, then start recalculating that path, or that spacing, that

you have in the balusters above.

OK, so it's a little weird feature that a lot of people just don't ever pay attention to. The other thing on that, too, is if you are playing with each segment and/or angles greater than, you also will see down here you've got this, where's the justification? Do you want to start at the beginning or at the center?

Who's ever been very frustrated that you get baluster, baluster, baluster, and at the very end you've got like a two inch segment? You're like, man, I really would have liked to split that between the two sides. You can. You just say Center. The downside is, you want one handrail to be centered and one handrail to be at the beginning, you're screwed. You've got to duplicate your handrail.

This is why, if you get into a big project, you'll see like a 100 handrails that are all doing the exact same freaking thing. They just might have slightly different rules to this. The other option that I almost never use because it sounds really cool, but there's this thing up here called Spread Pattern To Fit. So as long as you don't care about code, you can tell Revit to say Spread Pattern To Fit, and it'll ignore the spacing you have above and say, oh, gee, you told me to go two feet but I'm five feet, so I'm going to make them like one foot six and 1/2. Or whatever the value would be. So maybe if you're just doing some sort of pretty decorative rail that's not, you know, code, that would be a good option for you. I really have never used that because it's a pain in the butt.

So, beginning, end, and center. You've got those. You've also got, then, this Excessive Length Fill. So if you're telling Revit to do the spacing of these balusters above, and it needs to be six feet long, but you've got a seven foot handrail, you're telling it, oh, gee, there's an extra foot of space that the pattern above does not lay out to. It'll fill it in with some other baluster.

Sounds really cool. The problem with it is, if you've got those balusters associated to anything else, it just puts them in there. And I'll show you what I mean by that. So I'm going to say, Beginning, Never. I'm going to change the value up here from four inch spacing to-- actually, I'm going to duplicate that line.

And then I'm going to say, Spread Pattern To Fit. I didn't want to do host. This is not the handrail I wanted. Give me one second and we'll go back to the other handrails they have out of the box. I wanted-- maybe this is the handrail I have.

Yeah, this one. So I'm going to grab this one, Guard Rail Pipe. And I'm going actually take the rail structure-- so, one of the things you can do-- excuse me-- with the baluster placement is, instead of having those balusters start at the host, you can have them start at one of the rails. I wish this Apply button would work.

You know, I have probably hit that button about 15,000 times hoping it would work and it never does. So you have to hit OK, and then hit Apply. But as you can see, I made these ones come in here and do something crazy. Probably shouldn't have hit the Apply-- rail one. I didn't pay attention. It's probably rail seven. Oh, wait, see I still hit this fricking Apply button. It drives me crazy.

So now these are coming in here. So I'm going to go back to that baluster placement, and I'm going to duplicate this one. I'm going to change this first off to be like one foot. Then I'm going to duplicate it three or four times. I'm going to hit the Apply button, and that won't work.

And so if I then come in here to this sketch, and I'm going to change this path-- this probably isn't complicated enough of a handrail. So you can see, everybody loves that feature, right? So the reason this is happening, if you haven't figured it out, is because my placement is one, two, three, four feet long. It will only place balusters if all of them can be placed.

But we've got this great feature to say Excessive Length Fill. I can go down there and tell it to use the same baluster. This is so cool. Oh, and that extra space, let's use the round 1 inch. Sweet!

Whoops. Want to tell me-- god dang it. Rail structure, no. Baluster Placement, excuse me. Spacing-- so, I want the spacing to be the same one foot. Great. OK. Woo!

[LAUGHTER]

AUDIENCE: Very close.

PRESENTER: So, really great attempt at giving us something we can use. It kind of falls short. So the whole reason that this is belling-- down, and the reason a lot of people get frustrated with Rails is because, when you do a spacing at something like that, if Revit can't place all of those balusters, it stops.

So this is where, sometimes, I'm going back into that rail structure, and it doesn't-- it rarely works, but I've had it work occasionally. And when you're looking at that baluster placement,

sometimes saying breaking at each segment in will help. Sometimes saying an angle is greater than-- depending on what your layout rule is, that might help you get these extra ones to come in. I've rarely been able to find a reason to use the Excessive Length Fill.

You can also say Truncate The Pattern, say OK, and then Apply, and it does do it better. So you have Truncate Pattern, where it's going to say, OK, if you can squeeze some of those in, do it. That is a good option on the Excessive Length Fill most of the time, but not all of the time. And notice that I'm showing you balusters, not panels. I'm not really going have a great tip for everybody in panels.

AUDIENCE: Yeah.

PRESENTER: There's not really a great tip on that. The way I personally do it, is I create an adaptive component family that can be hosted to-- not the balusters. You'll see what I mean by that later, to the balusters. And then it's an adaptive family.

And there's actually a guy who learned at RTC Portugal this year, in Europe. He has a Dynamo script that will do it for you. So I gotta go back to his handout and look at it. So, that's just some of those features you have.

Now, you'll also notice that I have only been talking about the regular baluster placement. You also then have Start Post, Corner Post, and End Post. So this is why I can make those intermediate balusters be short, and then have the start and end post sit there. But I also know that I've got an 80 foot long handrail, and this is not going to be structurally sound.

It's what we've always called the fat kid rule. If a fat kid jumps up and down on here, is that going to bend or not? So what a lot of people don't know is, I've got this right here saying Corner Post. And I want that corner post to be here. Corner Post At Each Segment End, or Angle is Greater Than, or Never.

If you say Corner Post A Each Segment End-- and this is probably the biggest tip, and this has been around since I've been using Revit, which is since Revit Seven. If I edit this path, and I split this here and here, that's a corner. Anytime there is a break in the sketch line, that is a corner. So now when I say Finish, I now have got those posts going to the ground.

So, if you've ever had a handrail where you're like, man, I need these to line up with joints in the edifice, or the stucco, or whatever you're doing there. Or I need those line up with curtain mold mullions because there's a balcony above or next to it. You can go through and just draw

five segmented sketch lines, copy them, and you will get a corner post at the end of each segment. This is one I showed at a couple conferences last year. Everybody was like, oh my god, I had no clue, that's huge.

So wherever you split it, you can get that. As long as you're baluster placement is set to be Corner Posts At Each Segment End, or Angles Greater Than. Up to you. So that's a huge tip that I use often as well. Just knowing this exists here.

The other thing that ends up happening sometimes-- excuse me-- is that when I get up here, and I did show you that I can host these to different rails. So if I wanted to, I could that one go to rail six and that one go to rail five, and we'll have that one go to rail four. You can actually tell Revit to have different hosts of those rails.

So if you have a rail structure going across, you can tell the balusters to be associated to different heights of those. If you don't, it doesn't matter, because you can host it to those, but you can also come back into that baluster placement. And instead of saying, go to rail 7, I can say no, be associated with the host, but then give me a base offset.

I'm going to guess that's probably 8 inches. And then I can say in here, go to the host, and I have no clue on these, but-- go to the host and I'm going to guess this is going to be 16 inches. Does everybody know you can actually do foot, foot for an inch mark? So you don't have to go shift and hit the inch mark, foot foot's a little faster, if you cared. So I'll say OK. I'll hit the Apply button.

So you can see, I can move those up and down based on a value as well. So sometimes, when you're getting into your handrails, just knowing those little features will give you a lot of what you're looking for going through and setting that up. This all good? All right.

So getting down here-- and let me go back to my PowerPoint, just I know-- make sure I'm following through. Yes. We've got top rail and handrails. But when we start looking at the properties of a top rail or handrail, those are then going to be again made up of a whole lot of subcomponents.

So I'm going to talk about the subcomponents before I really get into the top rail or handrails. So you can see that, with the handrails themselves, we now have top rails, handrail one, and handrail two. Now the original reason why Autodesk gave those to us, is because, if you don't know this, you can Tab Select to get one of those nested subassemblies. So by using the Tab

key, I can select just the top rail.

Note to this, you also have to make sure that you are allowing yourself to select pinned elements. So make sure you have Select Pinned Elements turned on. Because when Autodesk first released this, they also released that feature of the flexion tool. I'm like, this feature does not work. What are you talking about?

Alex posted in the beta forum, like, dude, turn on your Select Pinned Elements. I'm like, dang it. So make sure that's turned on. But now I can come over here, and I'm going to just Tab Select to get to that handrail. And when you Tab Select and get that top rail or handrail, you have these options up here to either Edit the Rail or Reset the Rail.

Don't ever hit Reset. If you're unfamiliar with it, don't screw your fellow team members up and hit Reset and kill all their work. But what the Edit Rail will allow me to do now, is do a whole bunch of things. Are there any practical jokers in the room? OK, don't do this unless you know what you're doing.

You can come down here and change somebody's profile. And they'll be looking at the handrail going, what's going on? I Edit the type of this. I see that I'm using this top rail here. It's got circular inch and a half. It's using this profile. I'm a big practical joker, so I like to do things like this to people. So--

AUDIENCE: Thank you.

PRESENTER: You're welcome. See, that's what Revit radio is all about. Learning-- wasting billable hours. Not only of your time, but others. So one of the things that you can do, is when you edit the rail, you can change the profile. I have never once used this when I'm-- in reality. I've used it a lot of times to play jokes on people, but never in reality.

But what they really gave this to us is to come up here and say, I want to edit this path. So when I come in here, I can say edit this path. And then I can start drawing new lines onto this to start adding that additional path to it. Right? Boom, close enough, finish.

That's what they originally gave us the handrails and top rails for. So we can start playing with those paths and editing them and making them slightly different than the handrail. So it's a great feature that we use often. I use it all the time.

But what makes up that top rail? What makes up the handrails? So when I start going down

here to my families, and I'm going to go down to the railings, you well see that there is a whole top rail subcategory, as well as a handrail type subcategory.

So if I want to get to that Top Rail Properties, I can either come over here, and see what it is. Or again, you can Tab Select and go Edit Type over here. Either way I don't care. But you'll see you've got this whole-- I'm calling them subassemblies, because I don't think there is a really great term for it. That's a Mackey-ism.

But you've got this subassembly of top rails or handrails, and now inside of there, there's a lot of things going on. The first thing you have is, what profile are you using? So what profile do you want to be using here? You've then got this option of hand clearance. So the top rail has this as well as the handrail, because theoretically if I'm putting handrail on, I want to tell it how far off it needs to be from the sketch line.

And in this case, it had to be a negative 3/4 of an inch to line up with what the rest of the handrail was doing, so it can get confusing. But you can tell it what profile are you using, and then what-- the hand clearances. And a little known feature that a lot of people don't know, and I'm going to get a little bit in-depth into this is, I can change it from a miter to a filet. And when I do that-- that's not going to work because it's top, so it's got to be three inches.

I can actually have all of those joints fillet automatically. I honestly rarely use this, because inevitably every time you create a handrail, it's going to yell at you that you can't create the freaking fillets. And it's going to drive you crazy and put a couple hundred warnings in your project. So I don't do it this way. I do it a slightly different way and I'll talk about that.

So, when we get back into the type properties of that, you've got that-- what's also cool is, you can prebuild in these extensions. So I came in here and edited this. And I don't know which way I drew the handrail, so we're going to go do it to both of them. But I can tell it, I want an extension that's going to go to the floor, or I possibly want an extension that's going to return to the wall, or back to the post like I sketched it.

So you can have a top rail type that does all of this for you. Some I'm going to take one of them. I'm going to go return it to the floor. I'm going to take one of these, and I'm going to go return it to the post. And I'm going to say OK. I'm going to reset this rail.

And wait, didn't I just tell Revit to frickin' return it to the floor or to the post? What? And we wonder why we're all in this session. So when I go back and edit type properties, those only

work if you give it a value. You can't have it returned to the floor in its distance, or in its normal state. You have to extend the distance.

So I want to return that to the floor. Or I can come back here and I'm just going to throw in a value. I don't care what it is. And I'm going to come down here and throw in the value. That's a post, make that like two feet. And then once I do that, now it's returning to the floor, and returning back to the post.

AUDIENCE: Do you have to do a value if you click the tread depth?

PRESENTER: If you click Tread Depth, and it's on a stair, no, you don't have to have a value. But if it's just straight on the ground, yes, you have to have a value, because there is no tread depth. So, I'm sorry, question was, do you have to do that if you check tread depth, and I'll show you that in a second. Yes?

AUDIENCE: That can't be an instance property, right?

PRESENTER: Correct! Not an instance property. So guess what? Couple hundred handrails. Didn't I say at the beginning, you're going to be in a project and see you have like 200 handrails, they're all doing basically the same thing. So, yes. You cannot do those as instance based properties.

So that's kind of the downside on some of this. But if I go back and say Edit Type, the question was, if I just leave this at zero, and I say plus a tread depth for the beginning, will that work? Not in a flat situation. If this was hosted to a stair, then yes, it would extend and go to the floor. So it has to be asso-- if it's associated just flat, it does not work in that situation.

So you've got those values. And then the other thing you have in there too that's kind of cool, is you can also do what are called Terminations. OK, so this is the top rail. It has Terminations, as well does a handrail. So if I really wanted to, I could tell Revit to give me a Termination. And they've only got one out of the box. So now I get that nice wood block sitting there.

I'm using it to show blocking in the wall for the contractor. OK, maybe not. Sounds good right? But you can add Terminations. If you are in 2016 Revit, this feature is there. However, in 2016 Revit, Terminations will not show up on plan.

And it's looking like right now they're not showing up in 2017.1. Hmm. They should be showing up there. I wonder if that broke in 17.1? Because in 17, I did this session at a different conference a couple of months ago and it was working. So we might have re-broke that.

I'll have to investigate that. I'll open up my other file and we'll see. So-- actually, let's open up that file now and see. So this file. Let's go to level one.

I know this has Termination-- it's not showing up here. So there is a Termination showing up here. I'll have to look at why that's not. So Terminations in 2016, will not show up in plan. Still in 2017, if I select that same handrail, there's Terminations over here. They don't show up in plan if they're sideways. They only show up in plan if they're parallel.

So I'm just reporting it. Don't kill the messenger. Are there any Autodesk guys in the room that I can call out? I'm sorry. They're probably not going to raise their hands. Go down to the Idea Station. Go talk to those guys. But if you are using Terminations, they are not going to display in plan.

So back to this file. We'll going to 3D again. But Terminations can be great. So you saw in my previous little example I'd opened, I use them for the mounting rings or the escutcheon plates. Tim Waldock, he's better known as the RevitCat, he actually did this Aztec Mayan head at the end of this stone handrail he did. Although it didn't show up in plan, so it was kind of pointless. But in 3D it looked really cool.

So they can be used for a lot of things, including this coming back. There's a few downsides. For one, when you say to return to a post, there is no way to control what this distance is. So you get it to return to the post, but if you needed this at a given distance, you're screwed.

The other thing about this that's really, really bizarre, is if I go back and edit that top real type, and I'm going to tell this to return to the floor. And I'm going to go tell them to give me a three inch value. And I say Apply-- which won't work-- it will work at three inches. If I come back and make it one inch-- not one foot-- not-- just one inch-- it's yelling at me because I got a fillet up here.

So it's not going to-- I'll say OK. Boom. So it's yelling at me because I had a fillet up there. But if you go less than the fillet, Revit will usually tank on you and not create that at all. So if you have fillets turned in, your return to the floor, or any of these returns, have to be greater than the fillet. You can't make them less than the fillet.

So if I come back and make my fillet-- or make this a miter and not a fillet. These all took me forever to figure out, so I'm trying to save you guys some head banging on the wall. And we just go and say 0-1 and hit Apply. It's not liking one inch. Try one and a half? It's really not

liking that. OK, I really don't know what's going on with the out of the box handrail. Oh. I swear to god I said miter.

There we go. Yeah. As long as that's smaller than the fillet, it will not work. Just showing you some tips that I found. So that's why I personally, for me, I almost never build in a fillet to this, and I'm going to show you why in a minute.

OK, you've got materials. You've got extensions. We talked about that you've got terminations. Now, if you're using a handrail-- a railing that has a handrail nested to it-- is this one one of those? It is. So this one is a railing using a handrail nested to it.

So if I grab the whole type properties of this, down here you can tell Revit I want to be using one of those subassemblies. Which one do I want it to be? We'll switch it out so you can see what's going to happen. So I've swapped it out. I can also then tell it which side of that rail it's going to be on.

So I can switch it from one side of the rail to the other. Or I can say put it on both sides. I actually like that feature a lot. I've used it a few times. I got a rail going down the middle of a stair. I want it on both sides. It's actually a great little feature.

So you've got this. You've got handrails. Now when I go to the type properties of a handrail, it adds one additional thing. These are called supports. So you can see with this, when I select it, they've now got supports going back to the wall, or whatever support type you want to create.

Anybody using supports? Yeah? To point? So this is really where my first hack comes into play, learning about handrails. What's great about these is, you can Tab Select the supports. You can unpin them and move them wherever you want them to be.

You can take that support. You can say Copy. And I'm not even going to move my mouse in a good direction. I'm completely going like 90 degrees where it is. It'll stay associated to that handrail.

2016, there is a bug. If I swap this support out to be something else and there's only one in here, and then I go unpin another one, it swaps all those back to their default. Just the messenger. But what's great about this, this is my first hack.

Let me get back to my little project file. Where is it? I must have passed it. It's not this one.

This one. Has anybody ever wanted to be able to go Tab Select their supports, their balusters, and put them wherever the heck they want to do them? OK?

So that's not a baluster. That is a support associated to a railing type-- a handrail type. So if I actually grab this top rail and hide it, I've got this little-- because you have to have a profile on there-- I've got this little 1/16 by 1/16 profile in there. That is actually the top-- or the, excuse me, the handrail, that has supports down here, called inch and 1/2 by three foot six.

Now the downside to this, is those do not pick up automatically on like host objects. So if you wanted different ones in there, you'd have to have one that was three foot six. If you change the height of a handrail to be three feet, it's all going to move down. You're going to these balusters that are six inches too long.

So if I go back and edit the type of this handrail-- the whole handrail, not-- excuse me, the whole railing, not the handrail. And I come back here and say Edit Type, and I only wanted this rail to be 24 inches tall. And I say OK. The rail moved down, but notice my balusters did not. I'd have to go grab that top rail type, end the type, and tell it bum bum ba bum.

Its height is at 23 and 1/2 inches tall. Not feet. Hit the wrong button. I said-- so I have to move that up and down to work with the handrail, et cetera. And then when I do that, you'll notice now that the balusters are obviously way too long.

So the downside of this is, you're going to start creating a whole bunch of fricking support types that have different lengths to them. And it will not pick up on that automatically. So it's a great feature. I love it. I do this quite often.

And the part where you guys cheered before, this is usually where I just do a mic drop and walk out. But it's clicked to me it's a little bit difficult. And we have glass panels. We all talked about there is no secret for glass panels.

But if I just make a continuous rail feature, I can move my clip families anywhere I want them to be. So again, this is the same thing. That's not a baluster, and that's not a panel family. If we go down and start looking at this handrail set, when we come in here and we say Edit Type, what's happening is there is a rail structure that is just a really tall three foot five and 1/2 inch rectangle going up.

It's sweeping that rectangle along the path. I then have a top rail, which is my little u channel

here, that if I go edit the top rail type, this top rail type has the u channel. And then my little clip balusters, or supports, going across it. I have 15 clients using this exact handrail because they love it. They can unpin them, they can move them, they can line them, they can copy, they can go around. Question?

AUDIENCE: Do you ever do angle greater than on a stair? Does it work on a stair?

PRESENTER: No. It does, but it doesn't. So the downside to this-- again, I told you, I'm not-- I'm just the messenger. I'm showing you some ways to do this. If I were to go swap this out and put it on a stair-- da da da da. Looking for one called Glass. Probably called Guardrail.

Anybody sees it, yell at me where it is. Glass pane clips, up top. So, the downside is, is when Revit looks at doing profiles, it actually sweeps the profile like perpendicular to the stair which then makes it too tall. So, yes, this is that exact same handrail.

You can see that now my balusters don't work. My balusters-- I'm using that term loosely. It's technically support-- doesn't really work in this situation because it's not tall enough. Now, you can go in and create this, but the real downside is, is that profile actually changes the distances below this and this.

So you kind of get screwed in that scenario. Doesn't work the greatest on stairs. I do have clients who will do this, and they'll just actually go just create different support types at different heights and kind of figure it out and make it work for them. But, no. I wish I had a better answer for that.

That's where, like I said, you can actually go in and use adaptive component, place it to those supports that we're using is balusters. And then as those move, if it's adaptive component, it can actually stretch with it. So I'm not going into crazy adaptive component families. I want people to get a better understanding of what we have in our toolbox right now.

The other bizarre part-- and I'm actually going to check one thing first, because I might have fixed this. No, it's still broken. So the other bizarre part about this, that's kind of cool but kind of really bizarre, is I'm going to unpin this, and I'm going to take this and start moving it. What the? If your top rail is set to miter, but there is a fillet radius, your supports follow the fillet radius.

I'd been doing this trick for about 2 and 1/2 years, and I did not know this until about six months ago. Happened to do this on my client's project, and it was like, oh my gosh, look at

this. It's going through. So you have to go change your value to fillet.

Changes back to zero. Go back and change it to miter, and then, oh, those will actually follow what's going on with the rail. So just be aware of that. I only found that out six months ago. But it's a great little feature.

The other thing I like about it, too, is when you do Tab Select and unpin, you can swap it to be some other type of panel. I never get the correct one. So you can swap it out to be a different one. So let me Tab Select this one, and nudge it over a little bit more.

So I had one that was two clips. Now I've got, you know, four clips. I can keep swapping it out. I can make that be whatever I wanted it to be. Maybe at this end point, you're not going to use that. You're going to have just a rectangular post there, whatever.

So that's one of the beauty things of this, is you can keep Tab Selecting and swapping them out to be different family types as you're going along. But they're all still associated to the handrail. So if I just were to come in here and say, let's edit the path, let's just take this path and nudge it down a little bit. Say Finish. They're all moving with it.

That's the beauty of this. It's not some crazy family you're putting out there that's not following what's going on. So that's one of the tips that I use, and I do have clients that do big atrium places all the time. And this is a great example. It works great flat.

The one thing about is, I'm not truly putting a gap in here. I'm actually just adding another piece of material I call Gascony. And depending on what you make that material, it will render really well as long as you make it like a white plastic type material. I tried making it glass, but it didn't work. So I was like, oh, two layers of glass. It'll just render like an inch of glass.

Yeah, it didn't do anything. So just play with the material for rendering purposes. You'll get the lines and elevations. But you aren't truly technically getting that gap. The other time I really love to do this-- beepoo booparoo-- oh, I switched the handrail.

Let me go back to-- what was this one? I'm going to Undo a few times. Get the handrail back to what it was. Wow, I nudged a whole lot, didn't I? All right, we're just going to go down and get rid of all the nudges because I don't remember what the handrail was.

Sure, we'll do that. It's got to be here now. OK, back to here. So the other thing I love about this, who here has ever got to create gates?

How do you guys create gates? Is that a family? All right. So, what's cool about this is, you can actually just create that. I'm not going to it on this stair here, but you can actually come down here, and like I was saying before to this one, I can Tab Select that, change it out to be a gate.

Da da da da da. I've got too many families in here. Support gate. So, rectangle, round-- we'll just do rectangle. So, now we're in the round.

So we'll come through here and look at I've got this one, boom, so now it's a gate. That's not the one I wanted. That says TC. Oh man, my naming's off. Swap out this one. So I can swap it out, and I've got this.

What you can also do, and it will alleviate some of your problems, is you can to have instance based properties to these supports. Revit will still see that. So if I Tab Select that, and the width needs to change, I could just change the width to be whatever I wanted it to be.

So on the height, where I was talking about you'd have to go up the stairs and create different family types, it's not true. You can make those instance based properties, and then tweak them on an instance by instance basis. I don't do that all the time because 90% of the time, I want all of my supports that are balusters to be 3 feet tall, or 3 feet 6 tall. And I don't want to keep instantly Tab Selecting all of them to change them.

But in some situations, yeah, absolutely, I go through and do this. And again, the beauty part about doing this as a support, in my mind, is it moves with the rail. So if the rail moves, it's moving with the rail, wherever I move it to. And when I go to Visibility Graphics and turn off railings, it is part of the railings category, and it turns off with that as well.

The other thing is no one says these have to be part of the handrail. Has anybody ever noticed that when you go to Component, you can actually choose supports as something you're placing? So I can manually come down here and grab that same exact post, and place it wherever I want to place it. I'm in 3D, so I probably missed, but you get the point.

So you can place it wherever you want to place it. So you can take these supports, and manually place them like any other component. Like a desk or a chair or anything like that. So if you wanted to, you can go start adding these.

I don't do this often simply because I want it to move with the rail. But if I had a situation where now I just have a gate and there's no handrail, I will go place just my gate there. So I don't

have to go through a whole handrail to get that to be accomplished. OK, how am I looking at in time? OK, I have 12 minutes.

So that's kind of one of the tips for me. Now, the other thing that railings have that I don't know if everybody knows, has anybody ever wanted reflective tape on their stairs? I kind of thought this was pointless, but one of my clients wanted it. You can actually, in your stair properties, actually add a stair nosing profile that would do this. But this client was adamant, they wanted it to be a given distance in from each side.

That's a handrail. I'm not going to show you stair tips. This is a railings class. Come on. So, you will see that if I select this, this is a handrail. One of the features you have when you are doing baluster placements, is if you're on a stair, use x amount of balusters per tread.

I happen to be using a baluster called tread nosing. Now, if the stair widths change, again, I'm going to have to have multiple types of stairs. If I've got a three foot stair, and a six foot stair, and a nine foot stair, I would have to have three separate baluster nosing families. But what I can do in here is set that up, because that's all it is. One baluster per tread. I now have that as a handrail.

AUDIENCE: [INAUDIBLE]. The path looks like it's going straight up. Is the path on one side or the other of the stair?

PRESENTER: The path is on one side or other of the stair. And it doesn't matter which side because Revit knows. I just kind of switch it the opposite direction. There's also a bug, but I don't know if anybody's ever noticed, which has always been in Revit. That if I build a handrail that's got like these going that direction, and I put it on a ramp, it will go to the outside of the ramp.

So any railing you have that has the handrail to the right or the left, it'll be correct on a stair. It'll be opposite sides on a ramp. Just the messenger. OK? But no, so on this, yeah, it doesn't matter. If I go say Edit Path, you will see that it's on the inside.

I could have drawn it on the outside. It won't make a difference. If I were to take this handrail here, and-- that's not it. If I were to take this handrail here, and swap it to be that handrail type-- tread nosing-- it will go to the inside right on top of the other one.

So it doesn't matter. Revit's actually really smart in those scenarios, knowing hey, I should be going to the inside of the stair, not one directional. I have found-- and I don't know when this

broke, but I used to use this feature often-- that if you try to do one tread per-- one baluster per tread on a spiral stair, Revit cannot do the math.

I don't know about you guys, but that doesn't look like one, and they're not even all in the same position. So, I used to actually have this exact setting. I had to recreate it because I can't find old family, where I did people-- I did spiral stairs in residential homes and I had different supports for them. A lot of times they'd be logs. But it does not work on spiral stairs anymore. Yes?

AUDIENCE: On the elastic sample it looks they then put a [? nose cone ?] on the landing there. Is that right?

PRESENTER: On the landing? I don't know. I didn't notice. Probably not, because it doesn't see the landing as a tread. It's one baluster per tread, not per landing. So yeah, that's kind of a downside to that.

AUDIENCE: So in that case, would you paint it on?

PRESENTER: Huh?

AUDIENCE: Would you paint it on in that case?

PRESENTER: I would never paint. I hate the paint tool. I refuse to use the paint tool. And I yell at anybody who I know uses the paint tool. So honest truth, in a scenario like that if I needed one there, I would probably have some sort of family I could do.

And a lot of my clients-- I think by code in certain jurisdictions you only need it at the top, and you only need at the bottom. So we just have a face based family they can put there and it's done. With inches based properties for width. But this client, they had to in some jurisdiction have it on every stair and they wanted to do that.

And then they were going to walk up the stairs in Inscape, so they really wanted to just go through with, hey, look, we've got the reflective tape on the stair. And that family is all way over parametric, because I just like to geek out on those things. And it's got an angle parameter to match what the stair is. So you tell it what the actual riser height is and it'll calculate the angle. But that's just me going crazy, you don't need that. Yes?

AUDIENCE: With the stair there [INAUDIBLE]?

PRESENTER: Yeah, absolutely. That would be your baluster family, however you want it to be. But you would have to build that into the baluster family. And if we have time, I'll jump into that real quick. So, sorry, the question was, can I put those balusters on angle? Nobody throwing anything at me. You're all fired. Yes?

AUDIENCE: Hang on. If you split your railing, just like you did in the earlier trick that you were saying, would you get that last--

PRESENTER: So if I split the railing, would I get one on the landing? No, because that's not a tread, and I'm saying use one per tread. So Revit does not see landings as a tread. I wish it did, but it doesn't, so. All right.

So the other thing that I-- there's a couple other things that I do. And one of the big things that always comes up as a question to me, is this railing is, I don't need handrails on the landing. I don't have handrails on the landing. Right?

The thing to me that you will rarely see me do, guardrails never include handrails. Because if I have a guardrail, and I do actually have one in this sample file, that actually has a handrail to it-- it's s of these. Then there is no way for me to remove this middle segment. So for me, it's multiple handrails. I've got a handrail that is the guardrail.

I've got a handrail that is literally just called pipe only. OK, it says Mount With Return. But, it's basically just the pipe only with some wall mounts. Because when I do a stair, I am honestly probably done. I have eight or nine handrails on that stair.

So I've got one on the outside which is a guardrail. One on the outside lower, that's two. One on the outside upper, that's three. One on the inside. One on the base. I'm going to show you a tip where I would actually probably add another one for gypsum board underneath the stair. So when I'm done with the stair, I might have five or six railings inside of it.

So one of the tips that I do when I create a stair, you notice I created this earlier? And I told you there are handrails on the stair because it won't let me use Place On Host. I don't see handrails on that stair. There's two reasons why I do this. One, because I'm going to copy it multiple times.

But more importantly, people spend way too much freaking time trying to make handrails work in a schematic design phase. I'm a single person. I don't do real projects. And it drives me crazy I see people wasting time. If the handrails are there, people will try to work on them.

But what I do have is a handrail. It's right there. The reason why I do this-- you can't really see it up here, but it's that little square. The reason why I do this is, when I go to create a stair, I don't want people thinking about the handrails. Think about the stair first.

But what's a real drag about Revit-- I'm going to come over here real quick and out of the stair. If I take this stair and I edit this stair, and I'm just going to take this run and move it over. And I say Finish. If a handrail's path has been edited, it does not update with the stair.

So if you edit the sketch of a handrail, it does not update a stair. Yes, I could go grab it, say Pick New Host, move all my sketch lines. That in my mind is time consuming. Especially when I'm in still SD or even DD. So what I do is I have a handrail inside there.

Oh, OK, fine. Let me just copy this to the clipboard. Let me say Paste, same place. Let me change it to be my guardrail plate stringer. Guardrail plate stringer. No handrail.

I've just updated it. I don't keep the originals. I just delete them. Stair updated. Great, got to delete this one up here too.

Now I need a handrail in there. I don't even have to go copy it to the clipboard, because I still have it sitting there. Now I'm going to go ahead, say Paste, same place, swap it out to be my handrail-- rail only. I'm going to edit the path. I'm going to delete these top lines.

I'm going to say Finish. I'm going to go say Paste, same place. I'm going to go say Edit Path. I'm going to delete these lines. Pull this one back a little bit.

You'd be more accurate than this. And then I'm going to tell it to be the handrail only. In my mind-- that's on the inside. And my mind, that's much easier than trying to go back and completely edit those. Plus, somebody's going to come back and say, oh gee, I need an additional thing to do this, or additional thing to do that. So my tip is, I have a placeholder handrail that is that 1/16 by 1/16, and it is set up to be embedded into whatever the stringer type is you're using for the stair.

Makes life so much easier, and I see so many people wasting less time for it. So that stair over there that I created, which is somewhere over here. If I wanted handrails on that, I don't change those out. I grab them both.

I can grab them both on the same side. I copy the clipboard, Paste same place. Change it out

to be whatever I wanted it to be. Guardrail plate stringer.

So that's my big feature. A lot of my clients do it. Some of them think that's the stupidest thing ever. You guys can decide. I don't care. I just really like that feature.

The other reason why I like that feature is, anybody ever checked for head clearance on stairs? How do you guys do it? Cut a section? Draw a line? Draw another line? Draw the two lines, maybe a reference point in between the two?

Oh, no. You guys are now done with that. I'm going to copy that to the clipboard. Paste same place. What do you think I'm going to do? If you don't know that, you should, because it's the name of the session. Head clearance.

I now have a 3D object to see if I'm hitting anything. So I've been doing this since Revit release 9, 9.1. That's not a new feature. So if you kind of come back to this stair over here and look at it, that's what this big green mass is. I can now check the head clearance of my stairs just by simply going through and putting a handrail in there.

Now I can cut a section, or if you really even want to, you could run an interference check inside of Revit between ceilings and floors and handrails. Or just visually look at it. It's usually easier. So that's the other reason why I keep those placeholder handrails in there. There's a lot of times where I'm going to want to see this.

But you're never going to leave that on, because if you leave that on and you don't have a filter to turn it off, it kind of makes your stairs look a little wacky. So you'll be like, OK, what's going on with that stair? And I've actually had some people do that. It's like, I have a stair, but I can't see any of the stuff. It's also why I made it narrower than the stairs, so it would kind of give me a clue that somebody has a handrail in there that is this.

So I just use it to check for clearances. I delete it when I'm done. And that's my little Head Clearance Family. OK? What do I have?

What time is it? I got two minutes left. I have two minutes left. Are there any other questions? Or I'll dive into one last tip that I always do. All good? OK.

So, the other tip that I have, have you looked at any of the families that I've been using? You're going to start seeing these acronyms at the end. So this is a big thing for me. When I first learned Revit, I used the brick three course profile family, and I put it into a wall sweep.

And I told it to be six feet tall.

And I realized that wasn't six feet tall, it was six feet to the center. And it was stacked halfway in between the wall. And the reason it does that, is it looks for the insertion point when you type values in for profiles, for a lot of things in Revit. So all of my profile families tell me this is a top center insertion point. This is a bottom center insertion point. This is a middle center insertion, point left center et cetera.

And the reason why I do that is because, when I go into a rail type, and I tell this railing I want you to be three feet tall, what does that three feet do? It's to the insertion point of the profile family. Do you know where your insertion points are? I do, because I go through and I put tc in there. So I know in this exact instance that three feet is to the top center of that handrail.

So I know that's going to be the top of the handrail. So that's kind of one of my tips. The other thing of reason why I do that, is because if I were to Tab Select this, and start saying Edit Rail, Edit Path, when I edit that path it's going to be to the top. So if I come in here and add this, and come over, and go out, and then come down, and then go back over here like this-- actually I wanted one going outside, let me reverse that line.

All right, so if I do this, you can kind of see that that profile's getting swept across the top. And if I come back here and say I want to edit individual rail joins-- I told you guys I would get to this-- I don't prebuild in the fillet. I'm going to pick this rail joint here. And I'm going to go ahead and make that fillet three inches. All right?

Maybe I'm not. I'll try four inches, just to get it there. Fillet four-- oh, got to use the inch mark. Three inches would have worked. I forgot the inch mark. So I'm going to do this here. But then the downside is, if I come over here and tell this to be a fillet of four inches-- what the? They both have a four inch fillet.

Because it's going to the insertion point of your profile. OK, so when you get through there and you start looking at it, it's the insertion point in the profile. So when you're doing your radiuses, when you're doing your elevations, et cetera. So for me, everything gets labeled where its insertion point is.

And just a last check, because you're all still sitting here even though there's a party next. I appreciate that. That's not what I wanted. Just cruising through this. The handout does have all of this stuff and way more. So if you-- I do have to handout open. Window, where's the-- so

the handout is a 22 page handout. It really, really breaks down into what's going on with all this stuff.

I know this was an hour long session. I crammed a lot in. I speak very fast. Sorry for you non-native English speaking people. I apologize.

So look at the handout. Download it. And again, Revit Radio. If you want to, get a preview tomorrow. But please, please, please, fill out the feed-- fill out the speaker surveys. Yes, if you want to give me a comment I spoke too fast, that's usually the top comment I get. But please fill them out. I can only improve as a speaker if you guys fill out what you thought, good and or bad. Questions?

AUDIENCE: Are data sets available?

PRESENTER: Data set should be available. Yeah, it should all be up there and downloadable. If not, email me.