

NORMAN AKIN: So welcome to Being Glued to the Bleu. And I asked before, first time visitors? I know David was supposed to be here, but he's not. So welcome to AU. Word of advice, leave yourself some free time. Because for the next three days, you're going to get so much learning, so much going on that by Thursday you're going to just say, forget it. My friend Larry there had a class two years ago, the very last class on Thursday. We were sitting in his class and we were just kind of falling out of the chairs.

So leave yourself some free time. And of course, that free time is involved as well in doing the class surveys. Because we really want to see our class surveys, and we don't take it personally unless you give me all bad scores, and then I'll hunt you down. No, I'm kidding, I will not hunt you down. Scratch that from the recording.

And like I said, welcome to Being Glued to the Bleu. Now I try to put welcome in all of your languages there. Google may be right or it may be wrong. If it says I owe you a beer, look me up at the exhibit hall and we'll get that for you. And the hardest one was the Australian welcome, g'day. I don't know if that's fighting words, or if that means welcome.

For the next hour we're going to look into the process of how we used BIM 360 Glue on the Bleu Ciel tower. And you can see some of the photos we've got going there. And again, copyright, I took all the photos. And on the original slide I had the drone videos and everything, but that was a 400 meg slide show, and it just really broke the system.

But again, welcome. And then who am I? Well as it was, I was walking down the hallway and the Autodesk people said, you, you're going to teach class. I said, well, OK what am I going to do? So actually I am the regional BIM manager of Hunt South. I do the southern United States. With AECOM, we have \$19 billion worth of work right now.

And besides that, I like to kayak fish. I love to smoke a good premium cigar. Good rum, it's got to be good rum. Can't be this Bacardi stuff, OK. But I'm also an uber geek. I've been using Autodesk products since 1986, and back then it was just AutoCAD. My background, over the last 30 years I've been in construction, been in architecture, manufacturing, as well as I've worked in chemical plants. So I'm kind of varied, I get along well with most people. So in addition to the work I do at Hunt, I am one of the AGC trainers for the CM-BIM certification, and I'm also rewriting the test this January. I'm helping on that team.

And if you notice the fishing lure in the corner, I wore my favorite fishing shirt. Like I said, I love to fish. This lure, it's got a little robotic engine in it, and it lights up. See there's a USB port, so you can charge it up, fish, and I'm just waiting to get out and see if I can catch something or if I wasted \$20 on it.

My first class at AU was the second year attended. I've been attending AU since 2005 in Orlando. If anyone was at the Orlando AU, it was a mess. It's nice being back in Vegas. Oh, and I don't know if any of you noticed a little rabbit in the upper corner. I have a tendency to ramble on, go on rabbit trails. And my wife said, why don't I do some planned rabbit trails? And I thought, OK, great.

So when I first started, I had a bunch of these. But if anyone was here last year, remember this guy? That's a drink mixing robot. You go and put your order in-- my drink's over here, by the way-- put your order in, and he would make that for you. So if you order a chocolate martini or something, you watch it shake it up, and it's really fun. But that is one of two rabbit trails. I did have a bunch, I reduced them down. So you guys are lucky.

So in this class, we're going to demonstrate how we use the BIM 360 Glue on the construction of Bleu Ciel Towers. Now there's some debate, where's the French speakers? OK, does that mean blue sky or blue heavens? Blue sky? Blue sky, OK. Then in that case, I'm going to pilot the rest of the class into blue sky.

So you see the QR code. Did everybody get to download the handout? If you didn't get to download the handout, this QR code has the text version of the handout on it. And I can't see my notes. So we established that Bleu Ciel is Blue Sky, not Blue Heaven. Now, this building consists of five-level underground parking, five levels of mixed use, which is retail and parking. It's got 27 levels of multi-family, three levels of penthouse, three levels of ultra penthouse. And this building in the background, that's our sister building to this one, which is the one uptown center.

The pool decks-- you can see one in that lower corner there-- are levels five and 28. So Hunt and AECOM, we've been successful using Navisworks as a collaboration tool. The problem with Navisworks is the time lag. With Bleu, we can make changes and are instantly updated, whereas Navisworks works we have to wait until it's uploaded. And then distribute it to the people, get it corrected, and then re-upload again.

So we're going to demonstrate how BIM, and we're going to maintain how our construction schedules were kept. We're also going to look into creating and interacting some coordination, and then we're going to examine the result to kind of see where we are and where we're going.

We're in Vegas, right? Has anybody gambled this week? Is anyone broke yet? I see a couple honest people. So what I did in the process of looking at this, since we are in Vegas, I decided to take our workflow and put labels to it so we can remember. I have the dice method. The decision, decide, and these are also the key learning objectives. But we want to understand the influence that BIM 360 has on a ground-up project. Where we're going, and how it's being used. Also with interaction, we want to understand construction coordination. And of course, we want to learn how the trades are going to use it, and then understand the RI.

So the decision is a first step in using the BIM process, correct? How many by show of hands have used some form of a BIM project? OK, now how many of you have had the budgets for those projects? Not very many. So from a common ground, we start a project, and we don't have a budget for it. But we do want it coordinated. So we get our go or no go decisions depending on not budgetary necessarily, but the complexity of the building. We're doing some UPS centers that they're warehouses, but the conveyor systems are very complex. So by putting those into BIM, we're able to see that.

A couple of questions that we ask when we decide is what's the training curve? Notice I say training curve, not learning curve. Because again, what Carl Bass said this morning is that we're going to spend at least 30% of our time learning. So what's the training curve, and then, will the field personnel use it? When we send this out to the field, do they use it or does it stay there? And we'll look at that.

And then after that, we're going to jump up to the live demo and kind of interact, show how the teams interact, and show how each other works together in order to coordinate those issues. And we'll learn how the trades coordinate, how quickly it can be, and then we'll just go from there. Does anyone have their laptops? Because if you have your laptop and you're logged in, you can go ahead and sign on, play with it. If not, we'll look at it on our phones or iPads as well.

And finally, we'll finish up by examining the ROI. We'll look at some comparisons between a couple of different projects that we have, and we'll look at that. OK, find my mousey.

BIM 360 Glue allows us to simplify model coordination. Very easy, very simple. Everyone on the team can look at the model live. It's live as it's going up. Our team members, our construction guys have BIM 360 Glue and Field on their iPads. So at any point they want to call the model up, they can call the model up, find their GPS location within the building, and build from there.

So what is the training curve? I usually have about an hour to train my people the initial start of Glue in the field. This was at Blforum where we were set up, and I was actually training them how to use BIM 360 Glue on a new project. The train curve is very small, whereas Navisworks or Revit-- any Navisworks or Revit experts in here? How long did it take you to become an expert?

AUDIENCE: Still evolving.

NORMAN AKIN: Still evolving. I heard someone say, it might have been yesterday, at the AECOM meeting, they said, someone who has 50,000 hours worth of Revit is our leader. And I'm thinking, Revit hasn't been out for 25 years. But anyway, we know it takes a long time to train on those programs, and to continue to train. Well, on Glue by the end of the class, I'll have you where you can go and open up a model, merge some stuff, create some clash reports, and then just walk on.

You ask yourself, will the field personnel use them? And there's kind of a couple different ways to get the field personnel interested. You have a kickoff meeting, take a box of donuts. In America, there's a place called Krispy Kreme. And if the red light's on, they're making fresh donuts. You go in there and buy them, and they'll give you a free donut for each one you buy. So it's a win-win situation.

But on this particular project, our superintendents ask us, what can this do for them? And we ask them, what can we do for you? We're here to help. Their main concern was that we are not supporting the project. That we just give them new software, they look at it, looks good. They put it on the shelf and they build on. And it's very dry up here.

So their concern was they're not going to have the manpower. [? Puja ?] Sapru, who is on my staff, she is dedicated to this project. Or she was dedicated to this project. The final coordination is tomorrow morning, so I'm going take care of that. Well, she left on maternity leave.

So anyway, she was dedicated to this project, and that's all she did. She would go out Wednesdays, they would have the coordination meetings. She would build the models, or she would take the subcontractor models and then she would work with them. On this particular project, I was out every Tuesday, and I would take photos, I would fly the drone around. And when people weren't inside, I would fly the drone inside to get all of the information we needed.

And of course, we go out to the field, these construction guys see a camera, they will pose for it. And look at these handsome fellows. This one, I was probably two blocks away with a 650 millimeter lens. And I was just trying to get some candid shots, and Matt stopped, and he looked around, and he's like, I'm going to look like I'm talking on the phone. I was like, come on. But yeah, they will always pose for pictures, and they will show you what they're doing.

And of course, with these handsome guys they'll always say, what's a standard response when you take someone's picture? I hope I don't break your camera, right? Has anyone heard that one? I always tell these guys that they're not nearly as ugly as some of the brides that I photographed. That kind of loosens them up.

So the decision, of course, was first involved for Hunt South. This is the first project that we had total immersion into BIM. 360 Glue, 360 Field, and 360 Docs. We had the support of management. They were all, yeah, let's do it. Until I said this is what it's going to cost, and then they said, well, good luck.

As a team of contractors and subcontractors, we sat down together and said, we're going to have to eat this to prove it works. And all of the subcontractors were on board, especially when they saw that the return was we're going to save a lot of money by doing it upfront. So we did that.

Now on this particular project, I guess it was about this stage, the owner decided he wanted eight foot doors. He specified 7 and 1/2 doors into this project. We were very quickly able to go into our Glue models, change that, and then coordinate around that without stopping schedule. Now this building will open up in August. When I left Monday, they were pouring the 24th floor. So we're kind of on a fast track, but the coordination, except for the meeting tomorrow on the roof, is all complete.

And this is what everyone was wanting to see, right? So I'm just going to bail out of that, jump over to here. Any questions so far? Any concerns, any observations? Do you need to get up

and do a jumping jack now? OK, just checking.

So when we create a project, we'll go to the Enterprise version of BIM. If you have BIM 360 Glue, you can create your projects there, or BIM 360 Field. We happen to have all of it, so this is where we go to create a project. Now you can access Glue either online, like I've got. You can download the program to your computer, or you can access it through your phones or tablets. The app for Glue is not available for phones yet, but you can still access it if you have a web connection.

So like I said, I like to fish, and so sometimes I do my work from my kayak, and the office never knows. See, I got one person laughing at my jokes. What they put in those brownies, anyway?

No, all right. So if we look at our projects list, since Bleu Ciel was our first one that we started, you can see we've got 154 projects now that are new. And we're using a combination of Glue, Docs, and Field on all 154 of these projects. So we've kind of latched on and taken off.

So I'm just going to go over to Glue real quick, and there's our sample project for the class. I didn't put a picture up there that's right next to the Bleu Ciel project. But if you look, the markup and the views are created. So I can just hover over, and I can see who's been in the project and who's been working it. We get emails that say so-and-so uploaded, and I probably get 300 emails a day. I don't read them all. I just go here, I see who's worked on it, see what their markups doing, what time they were doing, and it tells me everything I need to know.

David, for instance, was working earlier today, and so I know he was correcting some MEP problems we were having. And same with the views, I can see that. And you can see which models have been loaded up. And again, I sent out the email to see who's here. I'm going to open this one up here. And I can tell who's logged in, and who hasn't. Who's still waiting to accept the invitation from me.

All right, now if you open up Glue on your iPad, there's only two icons. There's the merge model and model icons that will show up. So you can open those and you can edit those. On the Glue itself-- I'll go ahead and click that open-- you see there's only three. There's the overview, and then merge models. OK.

So before we get to adding members, you really want to create a project. So I'm going to jump

back over here to-- am I losing anybody, or am I babbling? If I'm babbling, just throw something at me.

AUDIENCE: Can I get you to back up just a little? Because I'm not familiar with BIM 360 [INAUDIBLE] but this is not our [? memory ?] model, this is not architectural, [? RMP ?] or structural models, right? This is a secondary server where we upload like we would do in export or a mini model. Same for architectural, structural would export things.

NORMAN AKIN: You mean like Navisworks?

AUDIENCE: Yeah, so is this like Navisworks?

NORMAN AKIN: Yeah, this is the entire federated model. And for the purpose of the AU Wi-Fi, I'm not going to open up the entire model, because it takes a long time. But this is where we store our federated model, and we put it all together, and then we make our merge models in smaller pieces.

AUDIENCE: OK, so each division's working separately off this server?

NORMAN AKIN: Yeah, this is all in the cloud.

AUDIENCE: [? BM's ?] for the operator, like Revit. You go Revit, [? tulu, ?] and then down.

AUDIENCE: So are you sending out a second log to BIM 360, or is it the same visible model?

NORMAN AKIN: So his question is, in case you didn't hear it, is are we using 360 Glue as a secondary model, or is it the primary model? Let's say Revit, AutoCAD, those are your authoring tools. And what we've trained our subcontractors to do is to link that to the Glue model. So the Glue model is the primary model that's being worked on by all the individual pieces.

AUDIENCE: It's not live, though, right? [INAUDIBLE] 360, it's [INAUDIBLE] the architect [? lab ?] I've been working on. The upload [INAUDIBLE] model with Glue, we still have this model. It's not like we're combining [? 360, ?] right?

NORMAN AKIN: If the architect's model is linked into Glue, it is live. Otherwise it is a standard upload.

AUDIENCE: But you can't bring ink models within 360.

AUDIENCE: You can't edit the model, you can't change types around.

NORMAN AKIN: Yeah, I mean you can move little pieces like you can in Navisworks, but you can't reconfigure for the authoring software. Good questions. All right, so of course, creating a project, it's easy. I'm just going to jump up to Add, or sign in. And of course, that's my password if anybody wants it.

OK, so simply just to add a project, and you put in your project name, your project type, and we'll go ahead and say project name, AU. Project type, I've got one down here. It says sample projects, demonstrate, there we go. That way I'm safe. Because I'll get an email from probably Lee saying, what are you doing creating these projects?

So construction type, new construction or renovation, and then project value. I'm going to make it worth \$1.00. I'm going to go for the holy grail here, just because. And of course, I can put all the other information in here. Project start date, we're going to make it start today, and end on Thursday. And Save and Continue. I guess I should've put the business unit, but since it's authored by me--

Now, once you save that, if you have the subscription that says that you have Docs and Field, you can go ahead and activate from here. So you're setting up your project in all three BIM 360 platforms right now. I'm going to activate, and I'm going to make myself the project manager. Then I can do the same thing for Field, as well. Talk about looking, look at that good looking fellow there. I make this construction workers-- no.

OK, what I'm going to do is jump back over here. We've already opened a project. So our project is open. It's a single click on the icon, opens your project up, and gets you moving. You can see all the different merge models. And again, if I want to add members, I can just go over here, click on Add, put your email address down. Let's see, anybody else from the class here? There's David, Eric, Federico, is he in this class, or is that from my other-- you're Federico. Nice to meet you.

But you can see these guys have already signed in. And if you want to get in on the project before AU is out, give me your business card or your email, and I'll put you on there. Feel free to play with this project the rest of the week. Make changes, build stuff.

So kind of a word of advice. If you're going to create an open project, create a template that has the file structure. On this project, I'm just going to jump over here to my file structure. And you see I've got plumbing, mechanical, fire protection, electrical. I've got the standard. And for this project, I created a smaller tree. But on the real project-- just go backwards one.

So while we've been in class here, someone has opened up the Methodist Hospital. But if you look at the folder structure of Bleu Ciel, it's a little more complex. So always set your template so that you have the same information in Glue, Field and Docs. That's just easy to go by.

So open a project. See, I didn't chain the door, I got someone leaving. OK, so to invite others, again, you just go up to the member site, load them up, put them in there. And you can see again that we have quite a few people working on this project as well.

OK, so I'm going to switch now to my PC version of Glue, and we're going to see how to build a merge model. We're going to see what's involved in that. And then we're going to start populating that model with markups, with clash detections, and some views.

All right, so I switched over to my PC version here. And you can see I've got some merged models made already. And I'm just kind of looking through there to see. And I'm going to get More. So to answer your question from earlier on my merged models, here's the entire federated model. And I'll go ahead and just open that one up maybe, or maybe I just screwed up.

But the entire federated model's here. So all 260 models that are being used are in the federated model. And they're all linked back out to Navisworks, Revit, or AutoCAD. So if we want to create a new merged model, I'm just going to go up to Add Merged Model, and click over there. And again, here's my folder structure. So if I want to create one, I'm just going to level one, we'll start at level one.

Now one of the things that I noticed on this was that these models were named correctly, but they weren't named consistently. So if you look at level one right here, it says arc_level 01. Level And under fire protection, it says fp_level 1. Underscore So one is named 01, one is named 1. When you start looking, all the ones are grouped in the tens. So on a large project, you want to make sure that that naming is consistent.

So I'm going to go back to architecture, select level one, electrical. See, there's level 10. And that's level one right there. Fire protection, level one. And I'll just go ahead and stick mechanical in here, as well. Now to make sure that these were consistent, I would have underscored, level_01 on all of them.

AUDIENCE: How about putting the level first? Sometimes on [INAUDIBLE] I want to hover over it and see

what level it is.

NORMAN AKIN: That's another way. This is the way we happened to do it. And I agree, the level should be first, then the discipline.

AUDIENCE: That way when you [INAUDIBLE] you already got the level before you click on a little faster.

NORMAN AKIN: On this we did level by level. On a hospital project, we may do it ward by ward, or section by section. Now, when I'm making merged models, I always want to name it, like you said, I want to say this is level one, and this is my merged model. So I'm just going to-- oops, French spelling, right? I'm just picking on you guys. Level one, and I'm going to say merged.

Now, did anyone see what I did wrong by naming that?

AUDIENCE: [INAUDIBLE]

NORMAN AKIN: There we go. OK, so you were paying attention, good. OK so level one is merged. And of course, the second thing I did wrong was I put that in the wrong line. There we go. And you can see as it's loading up how quickly it made that model, merged it. So I have a level one working model.

But I'm going to jump back over here to my overall screen. If I can get it in the right model. And you can see right there that that is an instant communication. That's the model I just created at 5:35 central time. No, I haven't kept you in here three hours, so don't worry. So that's our instant communication online. So anything that's changed on the desktop, as soon as it's loaded and synced, it is loaded.

All right, jump back over here. And I didn't put the flooring in or anything, and so when we run clash detections it may not find anything. But your command structure is very simple. You've got your selection tool, your measure tool, models. We'll come back to this one in just a second. Views, your standard for all markups is the pencil. Activities, click on Activities. It'll will say that I created this model, when I created it.

So again, I know who's working on my model, I know who's changing it, I know who's behind. If my subcontractor says, well, I turned in my model, no, you didn't. And it's not a blame game-- David's over there shaking his-- yeah, it is. It's not a blame game, but it is a responsibility game. We want to finish the projects on time, on budget.

We have a baseball stadium going up in Cleburne, Texas. And maybe one of you knows where Cleburne is. And they want to play ball on April 1st. And through our coordination efforts, we were able to get ahead of all the rain we've had lately. And so the coordination's done while they're digging the pits. And that's going to be a fun project, because we've got four months to build the entire stadium. So anyone want to move to Cleburne and work on a baseball stadium? Just checking, just checking.

And then you've got your clash tool as well as your attachment tool. So I want to go back over here to the model tool, and you could see the four models that we put in this project. So as we get other models in, so we started our coordination, we'll get the other models in. What are we missing?

AUDIENCE: Plumbing.

NORMAN AKIN: Plumbing? The plumbing model, they just come in. So we get him, and I'm going to just add the new model to it. Plumbing, basement. See now, the plumbing was, I think, correctly named. Except they put a dash instead of a-- there's the underscore. Plumbing level 01. Oh, no.

All right, so I just go in, I add that real quick.

AUDIENCE: Do you have a preference, NWC versus [? EWGs, ?] [? RWD, ?] or DWF?

NORMAN AKIN: Do I have a preference of NWDs, NWCs, DWFs? No. They will all fit in here. Yeah?

AUDIENCE: I find with the NWCs a lot of times, as the models get updated, a lot of the clashes will return even though you've cleared them, or they've been ignored. So working with DWGs is a lot more beneficial.

NORMAN AKIN: The NWDs or NWCs, if you're linked back to Navisworks, it has to be linked back to drawing and then reload it into Navisworks so it's corrected. But if you've got that exact link, then it would be corrected. Yeah?

AUDIENCE: I find working with NWCs works better, just because of different versioning, and some people don't have object name [? versions. ?] That's why I tend to name [INAUDIBLE] versus [INAUDIBLE] file sizes.

NORMAN AKIN: File size, yeah. So there you have two different answers, and it's up to you. Whatever works

best for you.

AUDIENCE: Whatever resolves the fastest.

NORMAN AKIN: Think of the guys in the field. They're the ones that are going to be using this most. So what is more convenient and simple for them? That's kind of a rule of thumb. If they can access the drawings faster, than that's fine if they can access the NWCs. So situation.

So there's our plumbing model loaded in there. Very quick, very easy. And let's see. Do we have any clashes? We may not have any clashes on this model just because [? Puja ?] did such a good job on coordinating, but let's find out. So you go to your clash detection, and-- where'd she go? She was asking earlier about this process. But if you get to your clash model, you see on the one side the models that you want to compare, just like Navisworks, and models you want to compare to.

Also if you want to break this down a little bit, you can go through and pick your individual items, as well. I know when Glue first came out, it was model versus model. There was no breakdown. So now you've got to breakdown of this, and you can even break those down a little further. Because just like in Navisworks, remember your first clash detection on Navisworks? Some 10,000 clashes? The first time I ran a clash detection on this project in Glue, I had 5,400 clashes. Everything versus everything.

So just kind of keep that mind. But I'm going to run plumbing versus the electrical and mechanical. And the way I consistently try to name these is I always do the compare first. So I'm going to say level one, plumbing, to I'm just going to do electrical right there, just for simplification. But always do the level and then the compare to.

So I'm always consistent on that. So I know that this is going to be on this side, and this is going to be on this side. So how many clashes do I have? I don't know. Zero. But the clash detection runs very quickly. Let me open that other model. And this one, you see I named it backwards. Or is that the model I just created? And pull up my clashes.

You see on this one, I ran three clash reports and I've got seven clashes. So I'm just going to jump over to my clashes. This is how we coordinate with our field group, saying that this is the way it should be. Now these clashes are very minor. One inch versus 1 and 1/4. I've been in some coordination meetings where they clashed through flex duct. And they said-- I'm going to take the hat off, it's hot.

But these are very minor, of course, flex duct doesn't clash. But I'm just going to look up one real quick. And of course, that fire protection is going through the return vent. Or the defuser. And there's the unique ID for that. But that's says HCAD flex. So is that pipe flex or not? It looks like solid pipe to me.

So the question is, as we're coordinating with our groups, we're saying, OK, whose fault is this? I'm going to just close this down here. And I'm going to make a markup. And again, it's very intuitive. You just do your markup, I'm going to add a markup, circle my problem, and put my text in that says move FP. So I'm assigning that to the fire protection, hit Save. And my text went off somewhere.

But you see the markup is there. I can now take this mark up and email it to anybody on the team. So they will understand. I'm going to send it to, since Dave is sitting over there. So I'm sending it to Dave, he should get an email in just a minute saying that he's got a problem there. Dave, you're fire protection today.

But again, if I go back to my project, and there's that markup that I just created live, on time, real time. Any questions? Yes, sir?

AUDIENCE: Is there a way of showing side [INAUDIBLE] inside clash detection? I know it says when you [INAUDIBLE] they really go through all [? the best ?] side docking?

NORMAN AKIN: So when I send out the notification, it assigns that to that person.

AUDIENCE: And you'll see that in that clash screen right there?

NORMAN AKIN: No.

AUDIENCE: So how does it detail or track what's been assigned? Is it just by the emails that they've gotten?

NORMAN AKIN: Yeah. Right now that's one of the downsides of Glue right now. But if you're linked into your Navisworks model, that will track over in Navisworks.

AUDIENCE: And we start finding out real quick which [? stubs ?] that is proactive, and the [INAUDIBLE] stuff which are--

AUDIENCE: Sure. I was just wondering, if I'm running this by the [INAUDIBLE] coordinator, and there's 155 on this level, is there an easy way for me to look at and go, OK, this one person got 50--

NORMAN AKIN: Well the easy way would be to put in the comments, or just to add a comment, electrical sub. And you can do 150 of those at once.

AUDIENCE: You also got them through, right? So when you set up the clash, you set up the clash on you got a level one plumbing versus electrical.

AUDIENCE: So this way you [? churn out it was ?] plumbing or electrical.

AUDIENCE: It even says in there when you do the clash, and you send out the comments, and you pull up the clash report, it should tell you who you assigned it to, if I remember it right.

NORMAN AKIN: Yeah, through the grouping.

AUDIENCE: And you can go through those clashes and you can pull out which ones are yours, and which ones are the electrician's, for example.

AUDIENCE: I have a quick comment on that. Under the comments window, you can create folders saying how the [? structure ?] you've created, and the other jobs, and just create a new folder for electrical, one for the plumber. And you just drag the comment into their folder. And that's the way we assign them and hold them responsible for it. So you just leave it in a common area. And once you guys determine who's going to fix it, move it to that person's folder. And that way we keep [? tracking. ?]

NORMAN AKIN: So everybody get that? Said we'll create a folder for electrical, for plumbing, and then we'll drag the comment over to that. OK. Yes, sir?

AUDIENCE: What do I do when the clash [? is in ?] the whole model, or just by the [? puzzle ?] class?

NORMAN AKIN: On this one, I just did it on the merged model, and I picked pieces out of it.

AUDIENCE: Product class, but in the [? view ?] folders? It is the whole model, or just divided?

NORMAN AKIN: No, we divided it.

AUDIENCE: And also [? in real life ?] it's not divided.

NORMAN AKIN: Yeah, I ran a sample on the whole model, and I had 5,400. And so when we broke it up, it's like eating an elephant, one bite at a time. Though the clashes were still there, we were able to make it much more palatable. Yes, sir?

AUDIENCE: Just with regard to that, typically what happens for myself is we run a clash, and there's so many elements, say, on one length of pipe, you can group them in Navisworks so that you have one pipe, and it reduces you, but you're at a meeting going through all of those clashes, you don't have 1,000, but it reduces them down to a group of sections. Can you do that with this, as well, or it's visual? It groups them all together, those clashes, [? rules ?] out there's one specified.

NORMAN AKIN: So I've got the seven clashes here. I'm just going to go here. See the little dots where the other clashes are. And if you hover--

AUDIENCE: You can also pull in [? words with ?] [INAUDIBLE]. You can [INAUDIBLE] here like a priority system or the other system, and it'll [? devolve ?] into anything that's seeing [? pipes ?] sections is all together, it just doesn't stay there. It's only [INAUDIBLE]

NORMAN AKIN: Yeah. And then visually, if you just hover over a dot, it'll show you which number it is. And so in your comments you can say this is number one, two, 650, or whatever. And then as you're looking you go, OK, this has already been checked.

AUDIENCE: In groups [INAUDIBLE] group by.

NORMAN AKIN: The group by, which is right here. Well, the group by says, review status or--

AUDIENCE: You might add two or three together. [INAUDIBLE] You see the first one, there's two together now?

NORMAN AKIN: Yeah. So the Group By, I just picked the whole model. So I've got two here, and then these are all singles. But if you look, this says flex, flex, and flex. So essentially these four don't count. And so I would go ahead and just close those out here out of the way. Our rule of thumb is anything under an inch, we just ignore. Because it could be just touching. If you're out in the field and you got sprinkler pipe touching duct work, it's going to show up as a clash. And so if it's over an inch, it's probably up in the duct and and it needs to drop down. But if it's under that, then it will flex enough to get under that.

So that's our rule of thumb, and it saves-- well for instance, on the roof I had 495 clashes on the Bleu Ciel project. I went through and turned off all the 1 inch, and I ended up with 27. All right.

AUDIENCE: Get loud!

NORMAN AKIN: Were they saying I'm loud? I can get loud. OK, real quick, to create a view you just hit the View button. And whatever view you're in at the time when you add the view, that's going to create that view. Now you can either say I want to send it out to the entire project team so that everyone can look at it, or I want to send it to myself only. Just because I want to come back, I'm not sure of this, I don't want to write an RFI yet.

So I'm just going to save that. I guess I need to name it, right? Let me just save you. So there's that one I just created. And again, if we go back online, we'll see that it's there. So that's saving views. Now a lot of times, we want to add attachments. And now what's deceptive is this attachments button will show you the attachments within the project. And it'll show you where it's touching. FP level one drawing. And that will show you what image is connected there. Dave, did you leave any surprises for me?

AUDIENCE: On what?

NORMAN AKIN: Did you put any images that shouldn't be up here?

AUDIENCE: Nope.

NORMAN AKIN: OK, just making sure. OK so that's actually the basement one, the main exhaust from that building. But those pictures, to add a picture or to add an image, video, whatever, you just select the object, and right click, and add attachment. You can add a file, a link. If you've got multiple images of this, it's best to put them in a PDF and then insert the PDF. If you try to put multiple images, it gets pretty heavy.

AUDIENCE: What do you guys find the best use of that is?

NORMAN AKIN: When we're in construction phase, we take pictures of the walls to make sure that all supports, or anything that's going to be hanging on the walls, to put those in the room itself. And then when we come back to Field and see that they're there, so we don't have to do deconstructive surgery to find our supports. Also in our RFIs and our punch list, we can see that these things have been done. But you just add your file, and I'm not going to add one, because we're almost out of time. So you just add your file, put it in there, and it's connected.

All right, let's jump over here real quick. So get to my notes here so I don't get lost completely. All right, so that was how we take an interact and coordinate with your group. You guys had

some good questions. But the result is you can get work done a lot faster. The whole team has that information available from the start.

Let's see, anybody from India? I know that's 12 hours ahead of where I'm at, and so they can work on the model when I'm done, I'm sleeping at home. But RFI reduction. Now by using the markup and the clash features, we're able to prevent time wasted on RFIs. And I know, I'm skipping that.

On this project, I showed you the sister project, one uptown. We have had a 28% reduction on RFIs on this project. Essentially the RFI gets written, but instead of the time that it takes, we can answer those almost immediately. And paperwork reduction. Like I said, I've been using Autodesk products since 1986. The promise was we're going to reduce paper. There was a survey that said we're using over 400,000% of the paper we were using in 1986. And that's because the invention of the personal printer, that made those affordable.

But the real savings on this one, and I'm going to talk about Southwest Hospital for a minute. We spent \$1.1 million on prints. A similar hospital that we're putting up, we have we spent \$160,000. That's almost a 90% reduction in paper cost. Of course, the main thing is reduced stress. Nothing is hidden, everything is available. And the picture on the right, that was taken with my drone last Friday. So a couple of days ago. That's where we're at is that building. And this is my contact information. I'll be here all week. Yes, sir?

AUDIENCE: So on your RFI reduction, can you find [? how ?] the architects are having architects, their [? knowledge ?] reduce that or no?

NORMAN AKIN: Yeah, they're part of the live project, and so we can send them a message saying this won't work, or we've got this problem. The doors, for example. And remember, fill out those surveys. I think this is thank you in most of your languages. And see my Australian there, again, I don't know if that's fighting words. Yes, sir?

AUDIENCE: Yeah, just one last question, you can just give me yes or no, and that should do it. I just want to know if it's capable. The transparencies, and changing colors, and all that stuff, you can still do that, can you [? move like you ?] can in Navisworks?

NORMAN AKIN: Absolutely. And I'll show you after.

AUDIENCE: That's fine.

NORMAN AKIN: All right, so that brings us to the end. And [MUSIC - QUEEN, "WE WILL ROCK YOU"] get you going here on a little music to get out. All right, thanks.