Autodesk University | SE3193-A-Practical-Strategy-and-Workflow-for-Large-Projects-A-Realistic-Solution.mp4

DIEGO FARIA: And welcome to a Practical Strategy and Workflow for Large Projects-- A Realistic Solution. So before we start, I'd like to tell you that this is the live class. So we're broadcasting live through the AU website to all the folks who can't be here with us today. And we'll be taking your questions through the mobile app, so you can just check in and put in your questions, Mark will be tracking them, and also through the Twitter. So you should use the hashtag #AULivestream.

A little bit about ourselves. Both of us work at Frazillio & Ferroni, which is a gold reseller. We're located at and Sao Paulo, Brazil. And we're pretty experienced into the AEC market, and also infrastructure. So we worked with very large engineering companies in Brazil.

Marco here, he's our main speaker. He will be doing the talk soon. He graduated in civil engineering and also has a master's degree in structural engineering. He's undertaking a doctorate now, also in structural engineering. And he's specialized in all the AutoDesk solutions regarding the structural part of it. So Revit Structure, Robot, AutoCAD Structural Detailing, and so on, and also BIM Management.

A little bit about myself, Diego, I am a bachelor of chemical engineering. So I got into Frazillio & Ferroni to work with the Plant Design Suite. And later on, I started working with Revit MEP, and also got myself into BIM Management. So we have participated in many, many implementations in Brazil. And that's what we're going to share with you today, a little bit of our expertise in the field-- what works and what doesn't.

So regarding the Class Summary, we'll be talking about workflow for large projects. So this is pretty much an interesting topic for us because large projects deserve more attention since they have more items on them and more stuff on them. So we'll be talking about what happens when we try to do that.

So we're focusing on structural projects because this is the main implementations we have had based on structural projects. And the idea here is to prepare BIM Managers for implementation. So we went them to have the idea of the whole process. And what they should be concerning from the beginning because if you don't go into that in the beginning, it becomes harder later on to correct those things.

This methodology we're going to show you is based on our past experiences with several companies. So we'll be talking about what has worked for us in the past implementations. The idea here is not to show how to do stuff. Pretty much we're not showing anything any rocket science thing. So you should be able to find how to do what we're showing. And if you can't, you can always contact us. There's no problem at all.

So the key learning objectives of this class is to manage large engineering projects using the Revit Structure, Robot, Vault, Navisworks, and Design Review software. So these are the softwares we are going to focus on today. We'll always show a little bit icon on the right to tell you which software we're talking about.

We want you to be able to identify project life cycle phases from Local Area Network settings to the delivery. So this is what we will be showing you. We want you to be able to explain the BIM process reality for an engineering office so that you can pass on information to your company. And also, identify best practices for work sharing in Revit, which we find a very interesting topic because there's no right answer for this. So we want to show you a little bit of suggestions on what we feel like is the best way to run things. But remember, these are suggestions.

So a little bit of what motivated us to do this lecture. So it's very common in the beginning of an implementation to run in a bit of situations, especially in large projects, so they tend to have more difficulties than smaller projects. Since they are a large, they have large amounts of documents generated. So how do we handle all those documentation? The short deadlines only make it worse because you don't have enough time for rework. You can't afford to make mistakes and start over.

And also, the structural project particularity, which is what Marco is going to talk later on. This is very important because the structural project tends to have a different approach from the MEP and architectural projects. You have to be concerned, always, with your calculations, your code design. So it's different from the other. So you have to take some more stuff in consideration. So I'll pass on to Marco. And I'll just check for questions in the Twitter feed and also the mobile app.

MARCO BRASIEL: Thank you Diego, good evening. First, sorry for my hard accent. When we had been talking about this presentation, we decided collect all we have acquired during the last three years implementing Revit and the other AutoDesk BIM software, mainly companies that design large

projects. Some of these companies designing all these [INAUDIBLE], I mean architectural design, structural designing, and MEP design and also in some companies that design structural projects only.

Big projects demands hard coordination tasks like [INAUDIBLE] detection, managing many people, so many documentations to be delivered at the final of the project. All of this adds up to small [? deadlines. ?] To this presentation we decided talking about the structural design because this kind of design, as Diego said before, is one of the most difficult disciplines to adapt to a BIM process. Either by the fact of the structural engineers has been designing project using old reliable software that it is not on BIM software. Or by the fact that the structural design its composed by a lot pieces, like the analysis, code design, [? form ?] work, and [INAUDIBLE] drawings, and so on.

Normally, we have different people working in these parts such that one can be using an analysis software, and the other could be using AutoCAD, for example. In this scenario, one off the most usual workflows is the structural engineer do you job on the reliable, not BIM, software and communicate to your design team what they should do.

We will show you all phases of the life cycle of a project looking through the point of view of the process, not about tools of the software, which are LAN Setup, Revit setup, Design, Revision, and Document Delivery.

Let's talk about LAN Setup first. This is the first task we will assume, and we will call this LAN Setup. At [INAUDIBLE], we deliver a lot of documentation of the project. And many people are working at the same time. All files needs to be organized [? search ?] that way you ensure that people are using the correct file. So all folders should be organized before design teams start.

The settings of the network environment should be done by an IT employee. All settings should be done using MS Windows tools. The way that these folders will be divided by the IT employee should suggested buy the BIM Manager. Well, if you ask me, I could suggest organizing the folders, like you can see on the screen.

So the first layer-- all files will be done inside this folder. But after this layer, you can create one folder for each of discipline because later in this presentation, we will show you that we will have many Revit files to the same project.

If necessary, you can set permissions for these folders as you choose. And you can do this

using [? MS ?] Windows tools. But remember that it's very important that you set as full access, I mean write and read permissions for all of them that we will be working Revit. Inside each discipline folder, you may create the other folders to [? save ?] the other's documentations like DWF, DWG, and Navisworks files, and so on.

Another important point is Drive Mapping. If you choose to create maps for each user, so please don't not do like this-- I mean G, for a user one, P for user two. Just created the same number, same name, for all users.

After that, [? it's ?] [? now ?] the time [INAUDIBLE] to the BIM Manager works. This is an important task when a lot of users are working on the same file. Some of these settings could be done previously, like the template files, that's should contain all of the annotations, the standards, projects, and shared parameters, and [INAUDIBLE] related libraries.

The Revit files, it should be one file for each discipline. So we will have a file for architecture, one file for structural, one file for [? MAP ?], design discipline. Also if you are designing a big building, you can also break the building in two or more pieces. Then we will have one file for each piece. And this is why all [INAUDIBLE] settings need to be perfectly matching.

Well, talking about [? sharing ?] the coordinates in Revit, we have a controversial subject. We know a lot of Revit experts say do not use shared coordinates in Revit. And another half of experts say, you can use shared coordinates in Revit, as long as you do it correctly.

Well, we'd like to use shared coordinates in Revit because we think that this is the best way. If you use it, the most important is that you choose what you want to do before the design starts. Therefore, you want to work by a shared coordinates, then remember to do this.

Worksets creation is mandatory when you are working for a while. So multiple users can working on it at the same time. Worksets can be divided in anyway, usually by systems, [? disciplines ?], or even user names. The idea is that the users working on that project can benefit from the worksets and use them correctly.

A tip is creating one or more worksets to put items that cannot be [? changed ?] by the users-- like [? linked ?] files, Navisworks, bills, and so on. It's the administrator workset. This could help prevent users from doing something unintentional. Finally, have a good best practices guide and deliver it to the designers before they start the project.

All settings are set, but then, if I invite all users to start the job, this is the design phase. I would

like to remind you that we are talking about structural design, but you go the also do the same to architectural or MEP design. Just remember that each one has your own particular aspect.

Let's talk about Revit for a moment. An important characteristic of Revit is that we can put working together many users at the same time in the same project file. Look at these three videos that we are-- look at these three videos. At the left video, the structural engineers are putting loads, fixing analytical models, and the creating some loads in different cases.

On the middle, you can see a designer working the same file. He is putting some holes at the beams or columns. In the left video, you can see it drawings that are being done at the same file. Also, in Brazil we need to use the AutoCAD structure detailing for some [INAUDIBLE] final drawings of the reinforcing elements, like columns, beams, floors, slabs. This parallel process needs to be explained with more attention. In fact, all workflows are explaining on the hand out that you can download on [? your ?] website.

We are using [INAUDIBLE] here because the projects that you made in BIM naturally delays did time that we start [? delivering ?] drawings. Because before drawing, we need a 3D model. And we are talking about many drawings, a lot of drawings. Some of our customers had problems to accomplish that line because contractors do not always know about BIM.

In fewer words, we have a software that allows many users at the same time. We have different kinds of employees working together-- I mean senior and junior engineers. We have also designers. And all are working on the same project at the same time. But they are executing different tasks. Then we need delivery faster and faster.

On the workflow showed now, structural engineers start the model because he will set for the first approach of the model, the structural model. Once finished, then others could work together on the same model. You can see the parallel process. We have a structural engineer adding loads, supports, and the members, at the same time, another design, or another structural engineer, it can work at the same model.

An important point is that the workflow can be changed if you want to do something different in your project. See an important point is that structural engineers can also run partial analysis, [INAUDIBLE] Robot structural analysis. All of this partial analysis cannot come back to Revit before the model is finished. So you can work in Revit, in robots, in Revit, in Robot. Then, at the finish, you can come back from robot to Revit. But, at this time, do not do anything in Revit.

Then once this project is finished, we can also work in drawings and deliver drawings. And I will call Diego to talk about drawings and how to use Vault to manage all of these drawings.

DIEGO FARIA: Well, since we've had no questions yet, have you guys got any questions you'd like to add up to this part? All right.

So for the revision stage, we have divided this into two different stages-- the 3D revision and the 2D revision. As far as the 3D revision is concerned, we're talking about Navisworks Manage for the coordination and the clash detection. And the important thing here is that this revision takes place during the process, that it doesn't help by the end of the project because, otherwise, it won't help at all.

So it should be defined at the beginning of the project, if it's weekly, biweekly, or whatever it is. But it should be defined already. So the coordinators can track up all the different clashes and assign them to the specific design teams so they can fix them within Revit or whatever other software it is.

Also, the BIM manager is involved in the stage because he's the one who's preparing the models for the design review meetings. So he has to configure everything. And that's what we're going to talk about in the other topics, a little bit of tips and tricks to get that going.

So the selection and search sets, this is pretty much straightforward. The selection sets, you simply select them in the selection tree of Navisworks, and you save them. The search sets are a bit more sophisticated. What you can do is that you define a certain criteria for Navisworks, and it goes, checking everything in every file, and every time it finds it, it selects it.

So you could do that by name, by property. It may be a standard property are a custom property. It doesn't matter. And this is pretty much important because you can create these different sets. And they update themselves, these search sets. So you don't have to, ever time, go try and find stuff in there. You just create them, click them, it updates and selects everything. And this is pretty good for the clash detection.

The Navisworks Viewpoints, you must have already used them. But I like to stress all the importance of this because it's very easy for the users to have these Viewpoint saved, so they can check the clashes that were found and don't waste time trying to identify what it is in an XML file, whatever it is.

And also, it's important to use the viewpoints because they allow you to do the markups in

Navisworks. So you save a Viewpoint, and then you can mark it up, and specify to the user what you expect him to do. The switch back functionality-- I'm not sure if all of you have used it already, but the idea is that you have a Revit model that was imported into Navisworks.

And within Navisworks, you could have the saved Viewpoints, just like I said. And what you do in Navisworks is that you select a certain object. And you can simply Right click it and select the Switch Back functionality. And what it does is that it brings up Revit again. The model doesn't even have to have to be open. And it brings up the model in the exact same Viewpoint with that exact same element selected.

This is a pretty good functionality, especially in large projects, because it just takes a lot of time. It really saves a lot of time because when you're talking about a little piece of [? fitting ?] or something, you can simply Right click it and go straight into Revit to fix the clash. The switch back functionality is an add-in that you have to install both in Revit and Navisworks.

The Navisworks view is another functionality that we find interesting because you can configure Navisworks to, instead of selecting the standard 3D view in Revit, to get a specific 3D view that should be called Navis. You just have to create a 3D view in Revit called Navis. And as soon as you do that, and you set Navisworks to get the Navisworks works view, what happens is that this specific view is the one that's always going to go into Navisworks.

And that's important because the admin or the BIM manager could always lock that specific view workset, so users don't mess it around. Because it's very common, if you have the standard 3D view, users just go there and change something. And then you bring it back into Navisworks and everything's messed up. So this is a pretty interesting functionality.

For the 2D revision phase, the key aspect here is the data management. It doesn't matter if it's done with vote or whatever it is because most big companies have their own data management solution. But it's important that you do it because otherwise you're going to lose track of whatever's revised, or whatever was delivered. So it's pretty important to keep track of it. We have been to projects that it wasn't tracked, so all hell breaks loose. It's pretty bad.

So we always indicate Vault because Vault is very much integrated with all the AutoDesk solutions. And the results are a pretty good, as I'm going to show you next. This is a suggestion of the DWF workflow using both Vault and Revit.

So the idea is that you have about Revit model. You can generate DWFs from Revit straight

into Vault. And that makes the files work in the life cycles that you have set in Vault and everything. So you keep track of where the DWFs are used and everything.

And as soon as it goes into Vault, the coordinator should be notified to know that there is a DWF file for revision. And what he does is that he can open up the file. He checks up the file, opens it, marks it up with whatever is wrong, and he can check it back in Vault.

As soon as he checks it back into Vault, he notifies, then, the user once again. And the user can [? link it ?] straight to Revit, as you are going to see. So he checks it into Vault. This video, by the way, I want to credit [? Doug ?] [? Jensen ?] from AutoDesk. He's a technical expert. And he's the one that made this video, but it represents very well the workflow we're suggesting.

So as soon as the DWF is involved again, the user can link it. And it keeps track of all the coordinates and everything. So it just pops up for the user. So the user can change that specific model again and put it back into Vault, back and forth, back and forth, until it's approved.

So for the last part here, the Document Delivery, we want to talk a little bit about the Revit Export. It's very common that people ask, oh, this Revit export to DWG and DWF, they're pretty much the standard formats for document delivery, and you say, yes, everything's fine. But they forget that they have to configure that.

So save some time for this configuration. It might be a little time consuming, OK? So don't expect the delivery day, you are going to have everything set up and just press OK, and everything's done. It's not. Probably, you are going to have to check the standards from your company with what Revit is exporting by default. And, probably, they're not going to match. So always remember that.

For the cloud collaboration, we call that because as soon as the documents are ready for delivery, you are going to have to pass them on. So pretty much Autodesk has many solutions that help you with that, Autodesk 360.

But I liked Buzzsaw very much, especially because it's integrated with Vault. So you can specify your life cycles for as soon as a file is approved, it gets sent into Buzzsaw, and Buzzsaw triggers notifications for all of your different collaborators that need that file.

And Buzzsaw also has additional security. So it's a pretty strong solution for that. I like it very much.

We got into model updates. The model updates, we wanted to talk a little bit about them because even though we work in companies that are multi-disciplinary, so they have architecture, MEP, and structure, there are cases when we have different companies making all the different disciplines.

So it's very important to schedule, in the beginning of a project, when those updates are going to happen so that's the BIM managers can figure out what their schedule is and just know when they're going to have to update the files. It's also very important that these files don't change the name so that when you have to update the model, you just simply have to replace the old file.

Also Revit Server comes into place here because Revit Server is a great tool to collaborate in real time when we're talking about different local area networks. And different companies, we can't link the files through the internet. Revit server helps with that.

And we're not going to talk very much about Revit Server. But it's pretty important to know it's there. And it's a viable solution.

So that brings us to an end. I'll like to hear from you, your questions, and what else have you got to say.

AUDIENCE: I really liked that switch back functionality. I was curious, in your guys' workflow, are your Revit models on a cloud that everyone's pulling from? I'm just trying to see how that would work in our office where all of our models and our consultant models get detached from central and sent to our Navis coordinator. And I'm not sure how the switch back would work in that case.

DIEGO FARIA: It should work fine. All that has to happen is that the file that's appended to Navisworks is available. So the person should have the file available. So as soon as you switch back, it goes and looks for it. It finds it. It just brings up Revit, and everything is OK. But in your case, your files should be on different sites, that's right?

AUDIENCE: They would just be completely detached. They would have a different file name. That's where, yeah, I guess the Navis file would have all of the views saved. And it would be matching a detached file, not our working central file. So I'm not sure how it would switch back to that.

DIEGO FARIA: I'm not sure if it would work like that because it has to maintain some relationship to the file.

AUDIENCE: How do you guys do it?

DIEGO FARIA: We have the file available. So in the same network as we have the Navisworks to model, the Revit file should be available as well. So if we're talking about completely detached files, probably, it's not going to work.

AUDIENCE: So everything is always shared for everyone's access?

DIEGO FARIA: Yeah.

AUDIENCE: [INAUDIBLE],

DIEGO FARIA: No, you're welcome.

AUDIENCE: I've always been in the habit of, when I receive a consultant model, of what I call replanting it--creating it as a central model on my network somewhere, in an appropriate location so that the worksets become available. Is that something that you think is still a good idea? And I haven't been working with 2014 yet, so perhaps we've gone past that necessity.

DIEGO FARIA: So what you do is that, as soon as you get the model, you recreate it in your network.

AUDIENCE: Yeah, open detach, Save As, or, if they've taken my direction, and used [? de-transmit ?], when they open it up, I would be instructed to save it as, or work in it temporarily. I will save it as a central model on my network. I've found, then I can make use of their worksets by turning them on and off, and so on, the functionality of it.

DIEGO FARIA: OK, I see no harm in doing that. Actually it's, pretty much what happens every time because people don't, when they send their central files, it just gets the message that's saying that it's been moved and everything. So that should be a good practice still. I don't think 2014 has anything new in that view, OK? So it should still work. And that's interesting, actually. Thank you. Anybody else?

MARCO BRASIEL: Any question?

DIEGO FARIA: OK.

MARCO BRASIEL: OK.

DIEGO FARIA: Well, thank you very much. Oh, there's another question.

AUDIENCE: You just briefly touched on the Revit Server. What would be your recommendation in terms of a best practice as deploying that as part of a solution for Revit.

DIEGO FARIA: Yeah, well the Revit Server comes into place when you want to link two different local area networks, right? So we have been using it in some cases where they wanted real time. But mostly, people don't want it to be real time updated-- that's what Revit Server does-- because back in Brazil, it's pretty much hard to reconcile all those changes. And since the model keeps getting updated constantly, we use it in very specific cases. And mostly, we use it when the same company has different sites in Brazil. So we use it in those cases.

But we have done it only once with companies that wanted to do it that way. Different companies using Revit Server to connect their models. And it went well, but still, I think there's some functionality that's needed in there. I've heard it changed a lot in 2014. There's some new stuff going on. It's getting better. But still, we use it in specific cases only. That's why I talked about it briefly.

First off, I'd like to thank you very much for being here today. It was a great pleasure for us to put this up. And thank you very much.

[APPLAUSE]