



Outline for Class CS20466 – Being Glued to the Bleu – BIM Workflows for Bleu Ciel Condos

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CS20466

Being Glued to the Bleu—BIM 360 Glue Workflows for Bleu Ciel Condos.

Norman Akin 

Welcome to CS20466 Being Glued to the Bleu. It's time to begin. Welcome to Autodesk University and Welcome to CS20466.

Again welcome to CS20466 Being Glued to the Bleu. For the next hour we will look into the process of using BIM360 Glue and Field for construction of high rise condos. Specifically on how we used the process on Bleu Ciel Condos.

Your AU Expert(s) Norm Akin.

I'm Norm Akin an avid kayak fisherman, cigar lover, and uber-geek. Currently I am the BIM Manager for the South Region of Hunt/AECOM and have spent 30 years using Autodesk, Inc., products. My background is varied from construction, architecture, manufacturing, and training. I tend to work well with architects, engineers, and contractors to ensure a successful project delivery. In addition to my work at Hunt/AECOM I am one of the AGC BIM trainers involved in CM-BIM certification training. Of course just like fishing, BIM is a passion for me and I am always trying to improve the process by adding new technology such as drone capture or LIDAR scanning and at times designing the perfect lure. My background has taught me to identify process problems, create solutions, and instruct others within the company culture. My first class at AU was also the second year I attended. This is my twelfth AU.

Class Summary and Description.

This class will demonstrate how we used BIM 360 Glue on the construction of the Bleu Ciel tower.

Bleu Ciel is translated to "Blue Sky". This building consists of a 5-level underground parking structure, 5-levels of mixed use (parking and retail), 23 levels of multifamily, 3 levels of penthouse and 3 levels of ultra-penthouse. The swimming pools are on level 5 and 28.

Hunt/AECOM has been successful using Navisworks software as a 3D and 4D collaboration tool. The net result has always been good, however, the process of using Navisworks software has resulted in teams not having the latest information. With BIM 360 Glue software, we can have a live link or real-time data connecting all of the trade data in one cloud model. Using the Bleu Ciel project and others, this presentation will demonstrate how to coordinate construction Building Information Modeling (BIM) and maintain construction schedules. We use BIM 360 Glue software to involve all teams in the process. Part of the process also includes adding photographs and video into the 360 model. You will also see the important roles of interacting and coordinating with other team members. Did everyone get a chance to download the handout? The QR-Code has the text version of the handout if you want to follow along using your phone.

Learning Objectives

- (Decision) Understand the influence BIM 360 Glue has on a ground up project.
- (Interact) Understand construction coordination process by using BIM 360 Glue.
- (Coordinate) Learn how all trades will use BIM 360 Glue.
- (Examine) Understand the ROI of BIM 360 Glue on a construction Project.

Because we are in Vegas this week and as an aid to remember the learning objectives I have created the D.I.C.E. method.

The decision is the first step in using any BIM process on a project. We get the go or no go decisions depending on budgetary constraints as well as building sophistication. We want to be able to understand the influence that BIM 360 has on a ground up project by asking these two key questions. What is the training curve? Will the field personnel use it?

Next we want to interact with all team members by understanding how the coordination process works within Glue. These points will be covered create a new project in Glue, open a project in Glue, invite others to interact, and create a new merged model.

We will learn how the trades will use BIM 360 Glue, how to find clashes, markup your models, share your views in the model, and attach photos and videos in your merged model.

We will examine the ROI on using BIM 360 by looking at RFI and paperwork reduction.

(Decision) Understand the influence BIM 360 Glue has on a ground up project.

BIM 360 Glue allows us to simplify multi discipline model coordination and Clash detection. Also it allows anywhere access to BIM models and object data for all project stakeholders. The distributed project team includes the BIM Manager, lead architect, HVAC designer, and structural engineer for example, and of course the client.

What is the training curve?

If you have never used Glue or Field before you got project access you noticed the ease of use within the programs. The program can be downloaded to computers, tablets and to phones. BIM 360 Glue and BIM 360 Field are not available to download to phones but BIM 360 will work from an internet connection. You just need to sign in with your Autodesk credentials.

The training curve is very small and the results are easily measured. Unlike Navisworks or Revit this is simple to learn and you can be productive within an hour. As a point I train my teams an hour on Field and an hour on Glue.

Will the field personnel use it?

The main focus should be will the field personnel be excited about using it or will it be just another thing that gets put on the shelf? When you have the kickoff meeting, take donuts. Ask the job superintendents what would stop them from using it. Find the answers and follow up. On this project the team was concerned with a lack of support from the BIM team. We have a person dedicated to this job as well as myself. Puja is the BIM Engineer that meets every Tuesday or in the case of Bleu Ciel met every Tuesday for coordination. Once the project moved past the initial coordination and clash detection we have been able to help coordinate other areas such as rebar. I was on site every Wednesday photographing and making drone progress videos.

Decision Recap.

This project was the first that involved total immersion into BIM 360. We had the complete support of management but not the budget for the level of coordination. As a team of contractors and subcontractors we decided to pursue the coordination in BIM 360 glue. We approached the management teams with the plan. Up till this point BIM was still considered a clash detection tool and that is all we used the process for. On this project the coordination allowed us to move forward on a very tight schedule. Also when the client wanted eight foot

doors instead of the seven and a half foot doors they were specified we were able to share with entire team quickly and resolve issues without stopping job progress.

Live Demo – Decision.

As I mentioned earlier we can access Glue from either online or by downloading the program to our computers or Tablets. If you are using a Microsoft tablet Google Chrome works much better than Microsoft Edge. Looking at our projects list we can see since the first project that is Bleu Ciel we have added several more projects to the list. The list you see is rather a short one as these are projects I am responsible for at the moment. If you look at Hunt's active projects we have 144 that are currently being built using Glue.

From looking at the project splash screen we can hover over to find out who is inputting information. For example we can see who is marking up, who is saving and who is sharing. In our sample project there is a history of who has been there. It is easier to do a quick check here than it is to trace all the emails that are generated when a party uploads or downloads.

You can also see which models have been loaded recently and open those files instead of the entire project. Pick on the model that needs viewing and it will open. If you are using the online version of BIM 360 Glue it will read NWD formatted files. You will need to install the BIM 360 Glue extension to view NWC files.

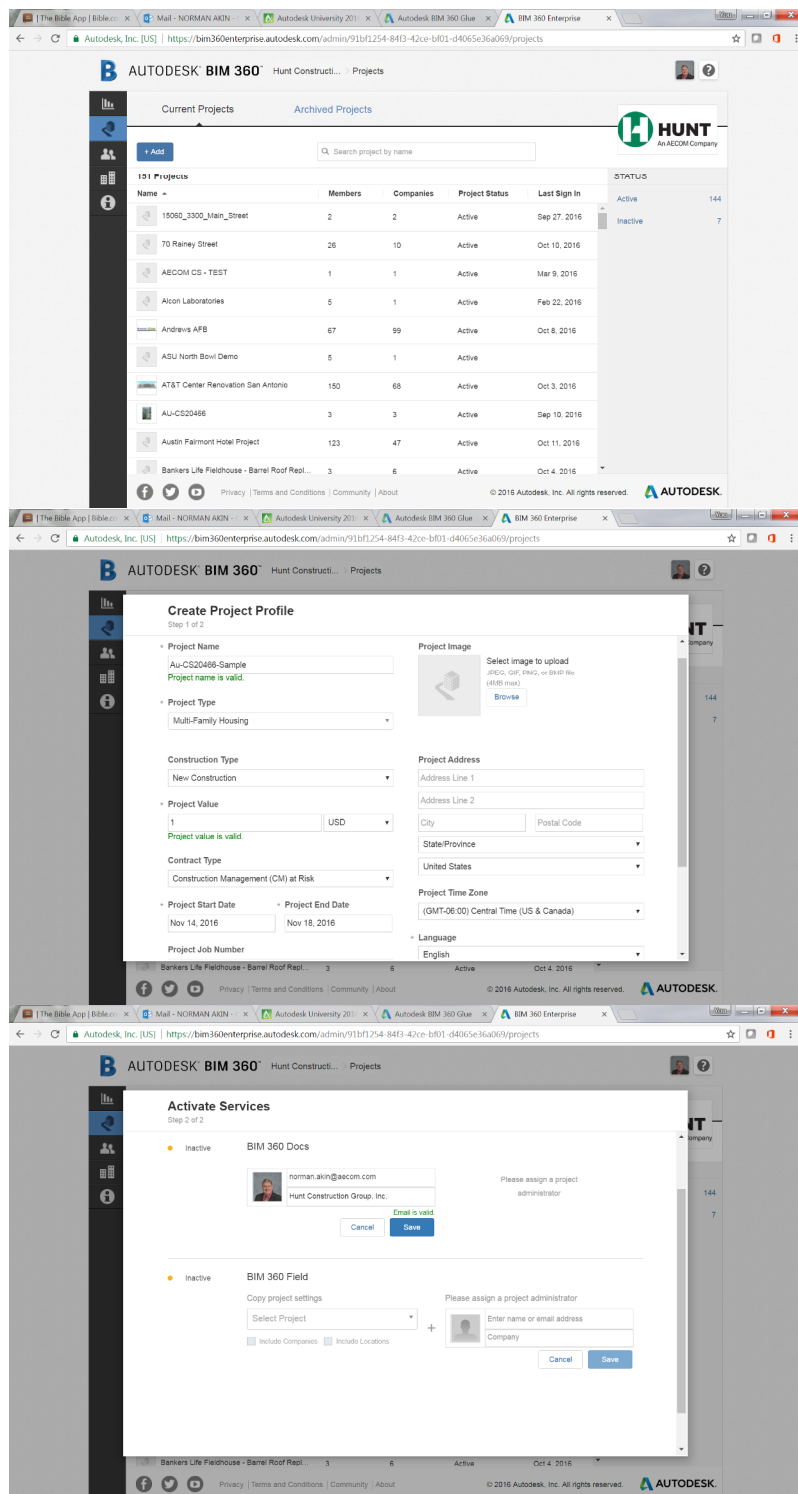
(Interact) Understand construction coordination process by using BIM 360 Glue.

Once you have researched let's take a more detailed look at how that works in practice and which steps you need to take as a BIM manager to make it happen.

Create New Project in Glue.

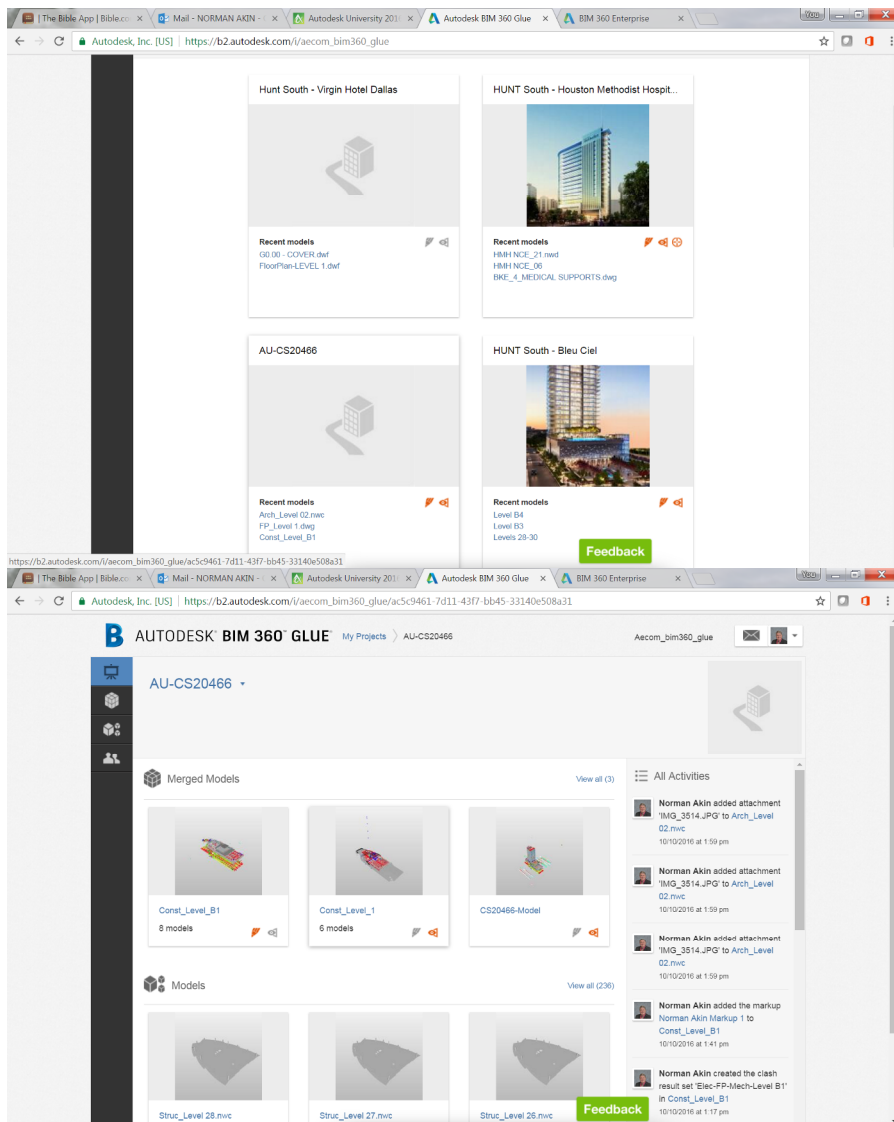
If you have admin rights you can create a new project in BIM 360 Glue or in BIM 360 enterprise. If you don't have rights see your IT technician to get a new project created. Create a folder structure before anyone is invited to join your project or copy a structure from an existing project. Of course this step is done for consistency. We have created a template that we use at the start of every project. It allows us to start working immediately. A word of advice maintain the same tree for Field and docs as well. To create the project we use BIM 360 and I log on as an account administrator. If all you have a subscription for BIM 360 Glue the process is the same.

1. From the project login screen select the add button to add a new project.
2. The project information screen becomes active. Fill out the project information.
3. Scroll down to the bottom and click save. The project is now created but needs people assigned to it.
4. When the save button is clicked the activate screen pops up. If you have BIM 360 Docs and BIM 360 Field this is the place to activate those programs and assign project managers.



Open Project in Glue.

Go to the Glue 360 Icon and click to open Glue or login to the online Glue using the Autodesk login information. Scroll thru the list and find your project. I emailed the class to see if anyone wanted to be added as a full project member and if I look at the list I see that some of you responded. I will be at the conference all week so if you want to be added I will add you.



To open the model simply single click on the project AU-CS20466. Within the project there are some merged models and there are multiple discipline models loaded. On opening project the overview tab is highlighted. The first thing that is noticed is there are four icons on the online version and only three on the PC version and two on the iPad version. Before we go to deep in the opening files new members need to be added to the project.

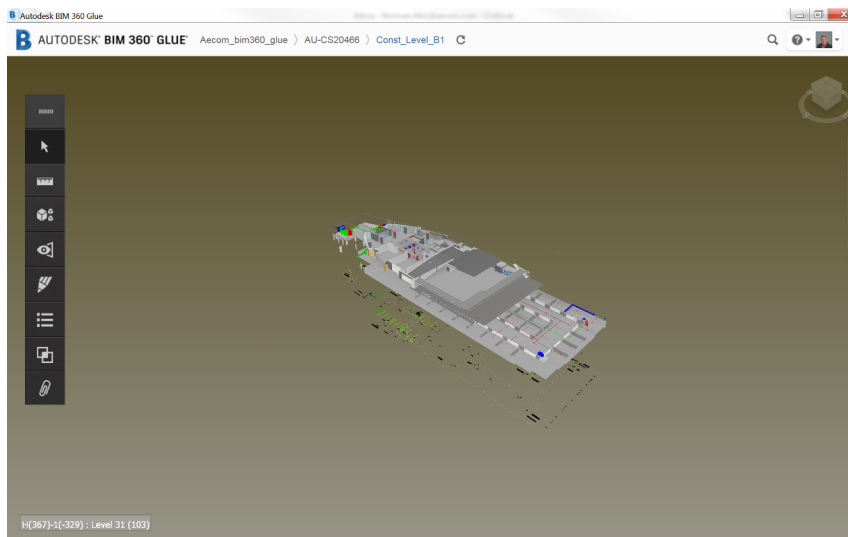
Invite others to Interact.

You probably noticed the only place you can add members is by using the online version of Glue. From here you can add as many team members that are allowed by your subscription. In BIM 360 Glue you do not need the company name but in BIM 360 Field you need to add companies first then you can add members. Once the person is added then the access can be set. The person

can be a project admin (can add, delete, and edit members and documents), a full member (can add documents), limited member (can download), or a reviewer (can only view the files). If you give a client access you want to give reviewer access only just for the protection of the files. Once added a member can start to work as soon as they login.

Drill a little deeper in the project.

For this part of the demonstration I am going to use the PC version of Glue. The merged model that I want to open is the Const_Level_1 model. Again a simple single click will open the model on all three devices. If you are using tablets the commands are on the bottom of the tablet and on the PC it is on the left or maybe center screen. It can be moved simply by clicking on it and dragging to new location.



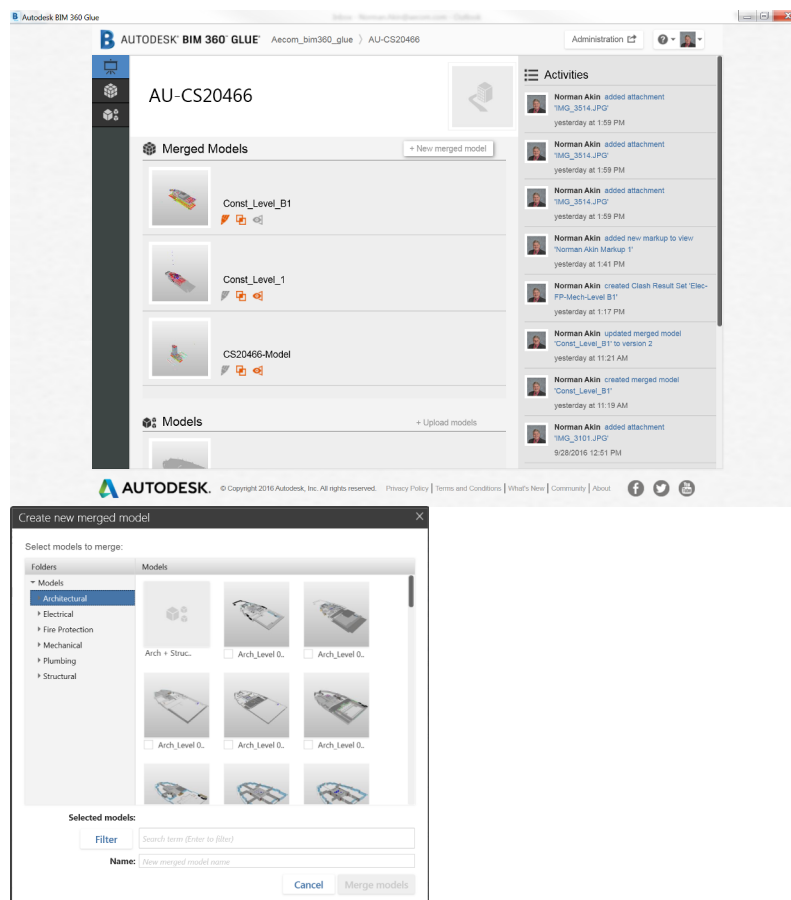
Notice the command structure. There is selection, measure, models, views, mark-ups, activities, clashes, and attachments. I want to look at the model tab. If you click on that you will see a breakup of the merged model. In this case the six models are DWG or NWC. A good rule to remember if it inserts into Navisworks it will most likely insert into Glue. The exception is a NWF file will not Glue. We will be using the other tabs later in the demonstration.

Create a New Merged Model.

As many models have been uploaded in Glue we will need to create merged models to interact with other groups. As you noticed the CS20466-Model is very large. Actually it contains 230 individual models and it takes some time to load up.

Our process was to break the models down to individual levels and created a merged model for each level. When you need, for example levels one and two you can create a merged model for those levels and leave the rest of the project alone until you need it. The steps for creating a merged model are simple and quick.

1. Earlier we opened up the Const_Level_1. We need to close that one and create a new merged model. Find the project name at the top of the screen. Just reminder I'm using a PC for the demonstration. Then single click on the project name and it will return to the previous screen. On the iPad it is the models tab which will go the project splash screen.
2. At the Merged Models List is the command + new merged model. Single click on that. The Create new merged model dialogue box appears. Notice how it gives a list of models and the folder structure. This project was simplified for this class. The actual folder structure for Bleu Ciel is quite extensive.
3. Select the folder and pick the model(s) that you want to merge. I'm going to pick all Basement 01 floor models. As you can see I selected a model from another level. Simply click on the model tab and remove it. The delete function does not delete from the entire project just this instance.



Interaction Recap.

As you can see it is very intuitive when interacting with and creating models for the project. Remember go online to add members. Go to PC to create and upload new models and go to tablet to edit and view models. Be consistent in your naming conventions. Some of the loaded models have Level_01 and others are Level_1. On large models it is easier to find things if the naming convention is correct. Create a template that can be used for all projects. As we quickly discovered interacting in BIM 360 Glue is fast and simple. Creating models from various formats can be done in minutes and are available for the entire team. Did anyone create

models while we were discussing the topic? Refresh your browser and you can see the other models that have been added.

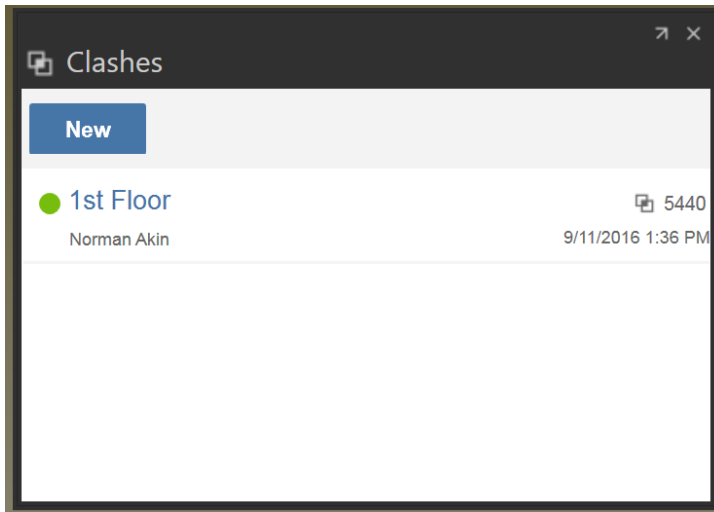
(Coordinate) Learn how all trades will use BIM 360 Glue.

Firstly everybody on the team is looking at the same merged model or the federated model which is built from all the individual models. That makes every contribution equal as everybody has the same model to view and as we saw earlier the whole team can create their own merged models. Everyone is encouraged to upload or glue the model on time or at least when significant changes and updates have occurred. It is really easy to determine if any team member is lagging behind or getting too far ahead. Model uploads need to be kept to the schedule to help each section get completed before moving on to the next section. This has some advantages: no more guessing where the latest model is or whether you are even looking at the latest version of the model. It also is very easy – if you can operate a web browser you can view the combined model. Simply viewing your own model in the context of others provides have a significant advantage. Microsoft edge does not work as well as Google Chrome.

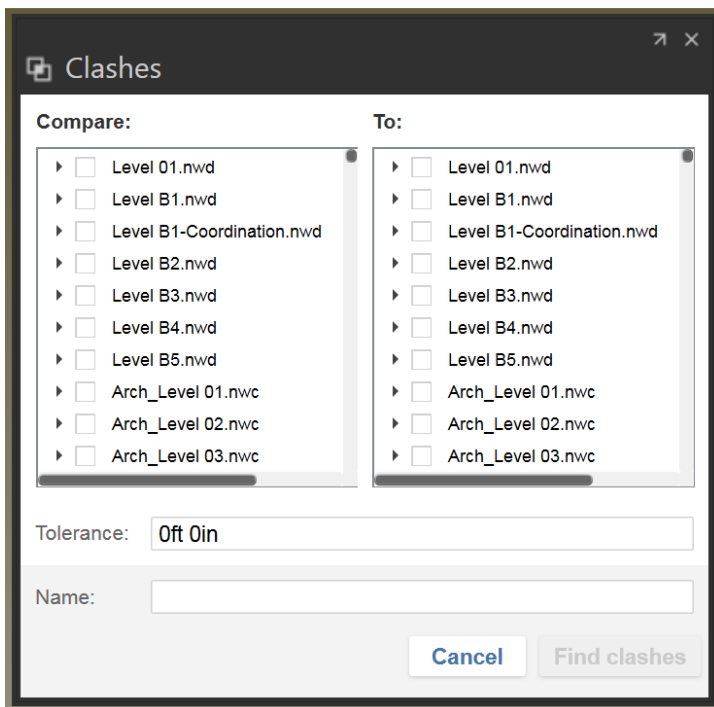
Secondly the whole team has the power of clash testing. This allows every user to validate their own design against the other models and to resolve clashes much quicker by communicating with others on the project. As an organic side effect the teams will speak to each other to resolve the clashes before the clash meeting. Not only does that speed up the process it also gives the BIM / VDC manager more time to fish or focus on the really difficult problems. It also means you don't have to spend every coordination meeting discussing a huge number of minor issues but we can spend that time talking about the huge bass that was caught over the weekend.

How to find Clashes.

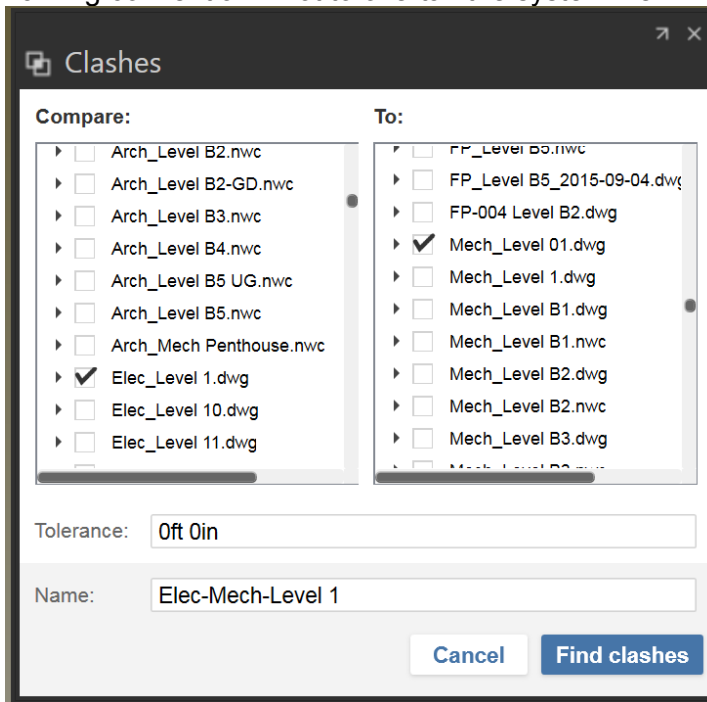
Of course the low hanging fruit is the ability to perform Clash Tests on your models. A clash test can only be performed on merged models. What we discovered on this project was that instead of creating the model in Navisworks and then loading to BIM 360 Glue it was much simpler to create in glue. We are now able to create clash tests and share with the whole team. The most accurate and concise information is always available at the time of edit. Find the clash button which looks like two squares crashing into each other. The screen resembles this. Click on new and this screen pops up. We are going to run the first clash test on Elec Level B1 and Mech Level B1 and name accordingly. Best practice is on naming convention “Compare” + “To” + “Location” or in this case “Elec-Mech-Level-B1”.



Click on new and this screen pops up.



We are going to run a clash test on the merged model we just created. Remember the naming convention. Not to overtax the system we will run a very simple clash test.



Click Find Clashes and view results. We see the results and the number of clashes. Do not run a clash test on everything at once or you will get a number that is not manageable. I did a clash test on the overall model and got 5400. Most construction workers will look at that number and throw it away thus making the process useless. So what we found on Bleu Ciel is that the more clash reports we had the less pushback we received. Smaller bites of the same problem.

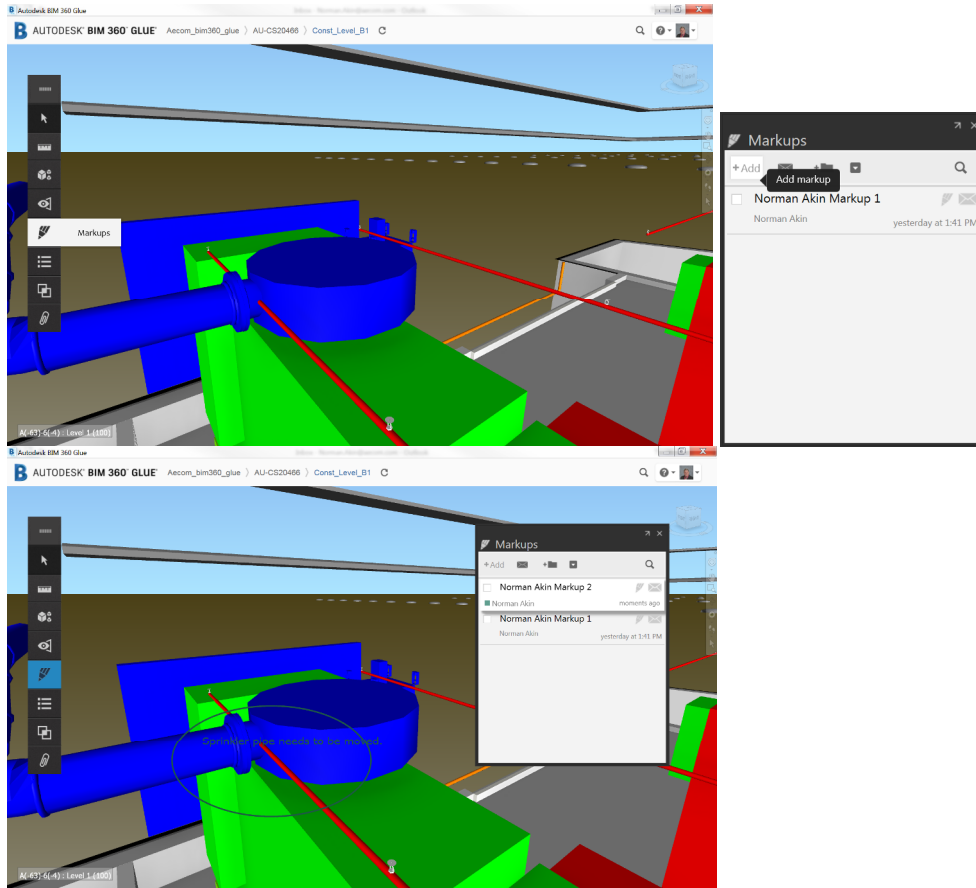
If you are using an iPad or online you can't create clash tests but you can review them.

Markup your models.

There are times when we need to create a marked up model. In Glue we can do that both in the PC version and the iPad version. On both the markup icon is a pencil. Select the pencil and the markup dialog will open. By clicking add markup the editing box will open allowing you to make any edits needed.

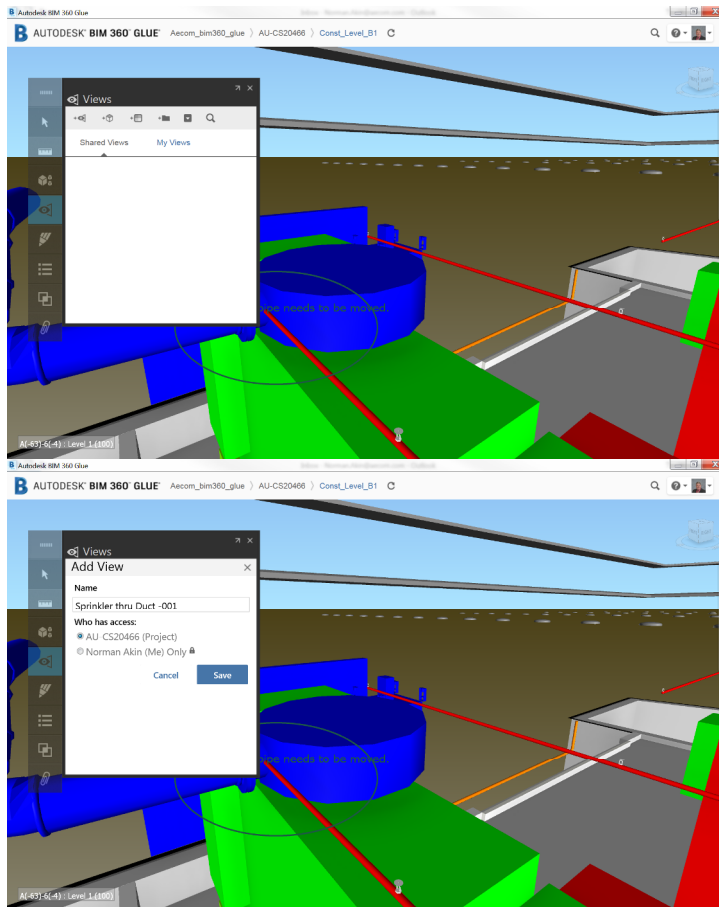
In our sample let's add a markup on some sprinkler pipe.

1. Click on add. Single click markup button.
2. Circle pipe. Find the pipe that has a concern and draw a circle around it.
3. Enter text. Place the text of what the concern is.
4. Save. It will create a markup and make that part of the project.
5. Email it to the person who needs it.



Add and share views in the model.

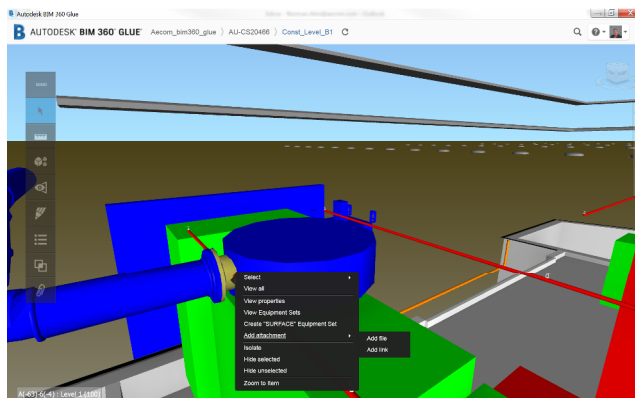
By selecting the view icon in the main menu it allows the user to create and share views. Use the add view command to create the desired image. There are two type of views you can create. Shared views will be sent to the team members and my views are only viewable by their creator.



Pick a view that you like and create a shared view.

Attach photos and videos to your merged model.

The attachment icon in the main menu will show all attachments in the current model. In order to attach photos make sure you select the selection icon so individual items can be attached. Once an item is selected simply then right click on the mouse. Click on add attachment and add a file or link. Once the file is uploaded the box will show up stating that the image was successfully loaded. If there are multiple pictures you can condense them into a PDF before loading.

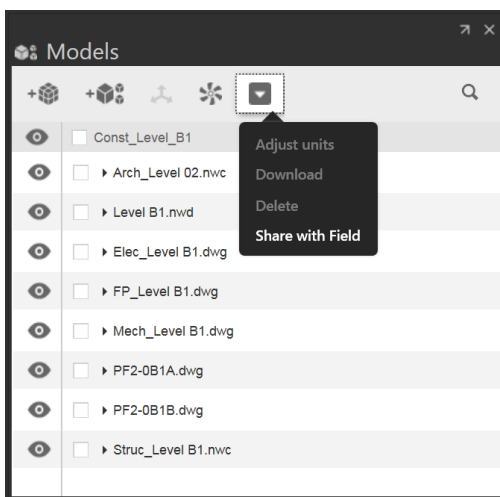


We want to practice uploading a photo.



Link the merged model with BIM 360 Field.

The BIM 360 platform is a very good way to work. BIM 360 Field was the Vela program before Autodesk bought it and incorporated into the BIM 360 platform. The workers in the field love the ability to be able to have the model handy for performing tasks such as daily reports, adding equipment lists, tracking deliveries, and tracking issues to name a few. The general process is to create a merged model then before anything is added to that model to link to Field. In this case we created the models on Bleu Ciel performed all the coordination tasks then made the link. We found that it was not the best way because the workers had to wait to start punch lists that could've been done much sooner. If the merged model is still open click on the models tab and click on the fly-out. Click on the share with BIM 360 Field and answer yes. The model is now shared with field. Changes in one place will be saved in both.



Coordination Recap.

The good news is that the coordination process is the same as you are used to. The bad news is no hiding from the crowd as it is an instant update and everyone can see what work is being uploaded or downloaded. Everyone has access to the model at all times. Coordination has been simplified and can be controlled within the Glue environment. If the model is linked to field equipment sets and field notes can be incorporated quickly and easily.

(Examine) Understand the ROI of BIM 360 Glue on a construction Project.

As a result you can get work done with less effort, improve communication and collaboration, can be accessed anywhere or anytime, will leverage cloud computing, save time, reduce costs, and improve project outcomes.

RFI Reduction.

By using the markup, clash, and view features we are able to prevent time wasted on RFIs. Since we have instant communication answers to concerns are quick and easy. Plus the added history features can be a method of record keeping. Essentially the RFI is still written but it does not take the amount of time that previous methods used. On this project compared to a sister project, the amount of RFIs went down by 28%.

Paperwork Reduction.

Since I started using Autodesk products in 1986 the promise has been this will reduce paper usage by X factor. Around the same time that Autodesk made that promise another invention was taking off. The personal printer became affordable. That and the ability to zoom in on what you wanted to show caused paper usage to be at roughly 400,000 % of what it was. Back to Glue we have demonstrated that all these things can be done electronically. That was an interesting fact but the reality is that we are able to reduce paper by using the BIM 360 platform to do our work. An example is one of my field engineers had to scan 4000 daily updates and reports to the CMiC storage that we used on his hospital project. He has been working on a similar project for the last year using BIM 360 and to date he has scanned three. I don't have the numbers for Bleu Ciel yet because it is an ongoing construction but so far the results are good.

Price Reduction.

On the UT Southwest hospital without using BIM 360 prints, plans, and spec books cost close to \$1.1 million. On Methodist hospital our printing cost was only \$160,000. That is almost a 90% reduction in print costs. Those savings can be passed on to the client. Once the project is fully integrated into BIM 360 there can be even more savings.

Stress Reduction.

All models get updated, nothing hidden, and the feeling of knowing that you are going to finish on time and within budget. It leaves more time for fishing.

Bonus – Best practices for clashing.

Rule 1: Update your model as often as relevant changes occur.

Rule 2: Check your work by running your own clash analysis.

Rule 3: Use the model and clash analysis for your purpose whether that's detailed clash review or general health check.

Rule 4: Communicate everything through clash comments, views and markups so that it is visible to the team.

Rule 5: Use clash reports and notifications to your advantage so that information is accessible right where it's needed for quicker resolution.

Rule 6: Continue the process until no clashes remain.

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