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## [Working During a Pandemic: Mobilizing using BIM 360 Design]

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### Learning Objectives

- **Manage** a large-scale rollout of BIM 360 Design.
- **Utilize** BIM 360 Design collaborative tools to enhance team workflows.
- **Create** effective model management processes through organization and permissions.
- **Support** a team working within the cloud as a BIM Manager

### Description

Having to accommodate a fully remote working environment, BIM 360 Design became the essential tool to continue working and collaborating as design teams with minimal interruption. Prior to the global disruption caused by Covid-19, only 20% of the company's portfolio was hosted on the cloud. Within three weeks all projects were successfully migrated onto BIM 360 Design and being used by the design teams. This session will elaborate on how Buro Happold's early adoption of the software laid the foundation for the successful migration of all projects nationwide. Learn how the design teams were able to make the switch almost overnight and the benefits they have found through utilizing available BIM 360 Design collaborative tools.

### Speaker(s)

Andrea Allas is a born and raised New Yorker. Since graduating with an architectural degree from Pratt Institute, she has used the global reach of New York City to develop a multinational understanding of the AEC industry. As an early adopter of Revit, her natural drive for communication, organization and innovation drew her to fulfill the growing need for BIM managers within the industry. Today she leads projects across multiple sectors and cities as a Digital Design Specialist where she puts her expertise in BIM Management to work.

## Managing the Rollout

With the abrupt shift from working in an office to working from home, a shift in Buro Happold’s standard Revit project workflow became necessary. Decisions needed to be made quickly and efficiently so design teams could continue to collaborate and meet tight project deadlines. This part of the presentation will take you through the weeks between February and April when the decision to fully adopt BIM 360 as our standard project workflow was made and implemented.

### Where We Started

The US Region of Buro Happold started off 2020 with our Revit central models spread across several cities and platforms. We had over 250 active users who would be collaborating together across the region and needing to access these models easily and frequently.

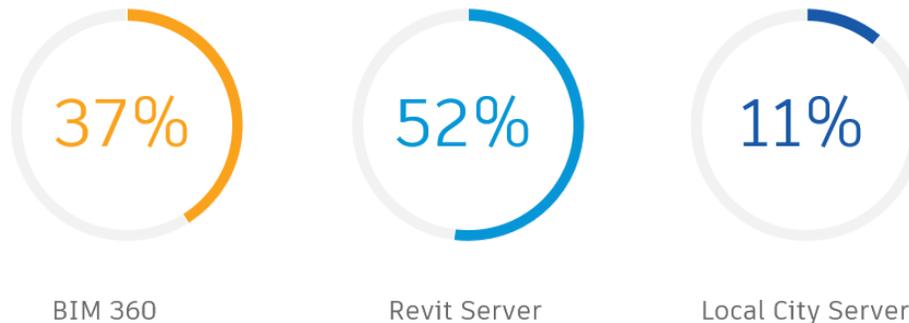


Figure 1: Percentage of Revit projects in their respective locations in February 2020.

### Buro Happold Team Structure

Our design teams are all taught to work and collaborate together using Revit as the tool of choice through which to express their ideas. Therefore every individual in these teams does the required production and submittal work themselves and is not reliant on a large BIM support staff. This division of responsibilities allows for a smaller BIM team that is more focused on training and project management. Our methodology was integral to the decision to switch to BIM 360 as we knew that our staff would be able to learn and adapt quickly.

### Gathering Data & Mobilizing

By early March 2020 it was clear that the US Region would be moving to a primarily work from home workflow for the foreseeable future. Therefore we needed to create a plan that could just as easily be adapted to these new challenges and conditions being faced by our staff. Taking a look at the resources we had available for Revit model hosting, we did comparison studies and benchmarking to help inform our decision for how to best move forward.

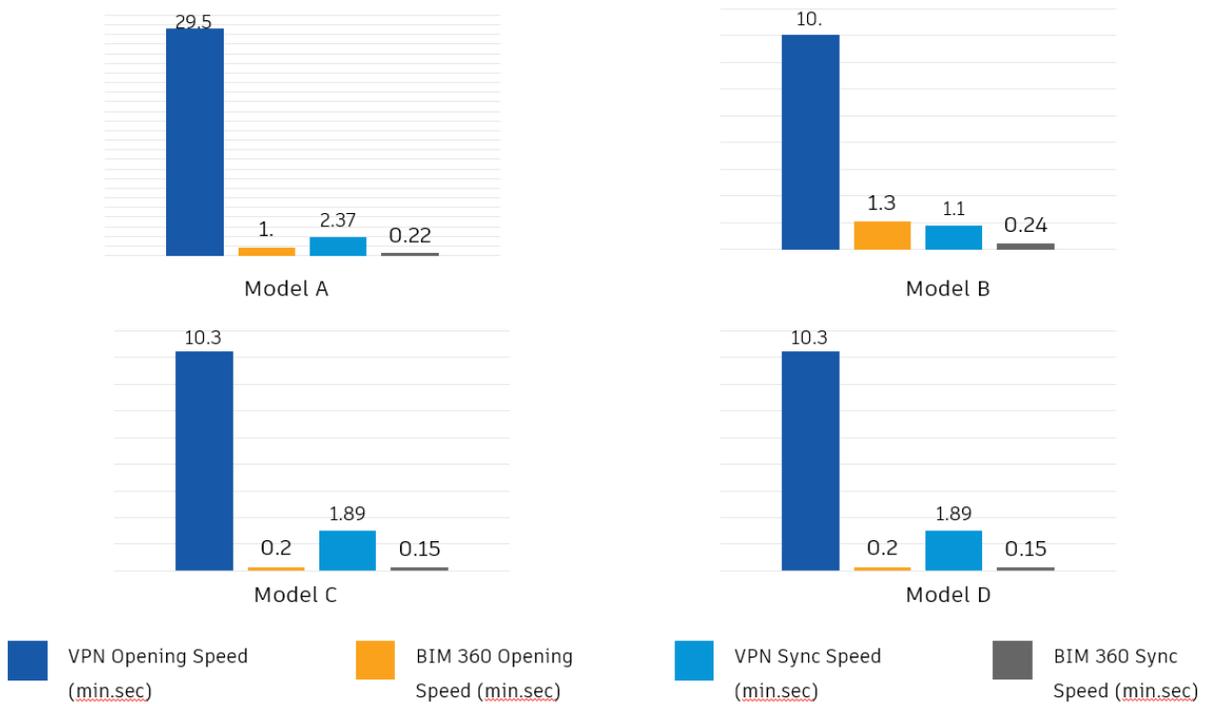


Figure 2: Revit model performance benchmarking study when being accessed through a VPN or the cloud.

### VPN to Server vs BIM 360 Hosting

Above you can see four graphs which are the results of some of the benchmarking tests we did comparing accessing a Revit model on Revit Server through a VPN or trying to access that same model hosted on BIM 360 cloud. Opening speeds through VPN could take several minutes and even close to half an hour as seen in the first column in Model A. These same models performed much faster when being opened through the cloud. The same performance disparity was seen in synchronization times as well with speeds through VPN taking several minutes while only taking seconds through BIM 360. Seeing the clear difference between the two provided the evidence needed to support the argument that BIM 360 was a better choice for remote working.

## Other Advantages to Cloud Collaboration

In addition to testing, we also looked at the other advantages that utilizing BIM 360 Design could bring to our workflows. As seen in Figure 1 we had already been using BIM 360 on some projects and had experience with the platform. While it was clear that the decentralized model hosting opportunity was a large advantage, there were other services which we could take advantage of like document management and cloud collaboration. With document management we could move our PDF review process to the web and it removed the need to spend time repeatedly uploading and downloading files to see the latest information. It also had review tools which could be a new avenue for collaborating. Design collaboration helped streamline model linking amongst different consultant teams and with a regular publish schedule, could create regular backups with no effort.

## Committing to BIM 360

After reviewing our resources and test data, we made the decision to fully commit to BIM 360 Design as our project platform of choice. To successfully move all active projects off of their disparate locations and onto a BIM 360 hub, we had to surmount several hurdles.

- **Cost** of covering additional BIM 360 licenses to cover the entire region.
- **IT Support** of providing software-compliant laptops for all users with Autodesk Desktop connector installed. Desktop connector is a necessary additional software to be able to link in non-native Revit files into models hosted on the cloud.
- **Logistics** of making the switch on active projects around their project deadlines without inconveniencing the design teams.
- **Training** all users to the new workflows and services which were part of BIM 360 Design. This is where our team structure was integral to the rollout process. As regular learning sessions and expected progression of Revit usage are already part of our team culture, learning about BIM 360 Design tools was just another day.

Once we had made the decision, completing the rollout was carried out by a team of BIM leads and all project were operational on the cloud by April 10.

## Utilizing BIM 360 Design Tools

Choosing to switch to BIM 360 Design as our main Revit platform was made for more than just the decentralized central model. The new workflow opportunities that came with Document Management and Design collaboration were an opening for new growth in the US Region and potentially the entire company. Here I will go over some of the key parts of these services and how it has helped the region grow in our new working environment.

### Document Management

The Document Management portion at the most basic level can function as a standard file transfer site but when explored further, has much more to offer. This is where much of the web-based capabilities like review and file history are accessed and where all the consultants on the team can view and store their files. Later I will go over how vital proper organization of this portion plays into the overall functionality.

When first introducing BIM 360 to a team, I make it clear that the Revit file you can download is NOT the project central file. Once loaded onto the cloud, the central model is made inaccessible by the majority of users which can be useful in ensuring that no one inadvertently opens and makes changes. After making this clear, I go over the 'versions' of the model and how there is a recorded history of each model. Through the publish function, a new time-stamped copy, or version, of the model is created and stored in Document Management which can be viewed and downloaded as necessary. Explaining this feature is key as most new users would download a model expecting to see the latest information in the working model but this is not always the case if working through live-linking.

<input type="checkbox"/>	Name ^	Description	Version	Size	Last updated	Updated by	Markup	Issue
<input type="checkbox"/>	Consumed	--	--	--	26 Jun 2019 14:21	Robert Fink	--	--
<input type="checkbox"/>	Project Files	--	--	--	10 Feb 2020 13:20	Adam Kushniarevich	--	--
<input type="checkbox"/>	 5495-001-E-R18.rvt		V54	5.7 GB	28 Sep 2020 22:01	Andrea Allas		
<input type="checkbox"/>	 5495-001-M--R18.rvt		V63	5.6 GB	13 Oct 2020 01:37	Andrea Allas		
<input type="checkbox"/>	 5495-001-P-R18.rvt		V50	5.6 GB	19 Oct 2020 21:50	Andrea Allas		

Image 3: A standard folder view through the web of Document Manager

### Model Viewer

By clicking on the file name of a model, a new screen will be brought up which gives access to the review tools. Here you will see the 3D version of the latest model and any sets including views and sheets which have been selected for upload. This is where team members are able to add markups which can be assigned to certain individuals and later verified for completion or additional comments. Through a regular weekly publish schedule, a fresh set of sheets and views are available for everyone on the team. The advantages this brings to the team are:

- Publish creates backup files which can be referenced or even reused
- Can compare model versions to view changes
- Sheets added to a set for upload is time saved on printing them for review
- Markup and tag team members on the web, does not require additional software
  - Comments are saved to the version it was made on

Making use of these web tools created a streamlined workflow that was easily adopted from everyone as they worked at home. The process was clear and having it stored on the project hub removed the typical email correspondence which was standard.

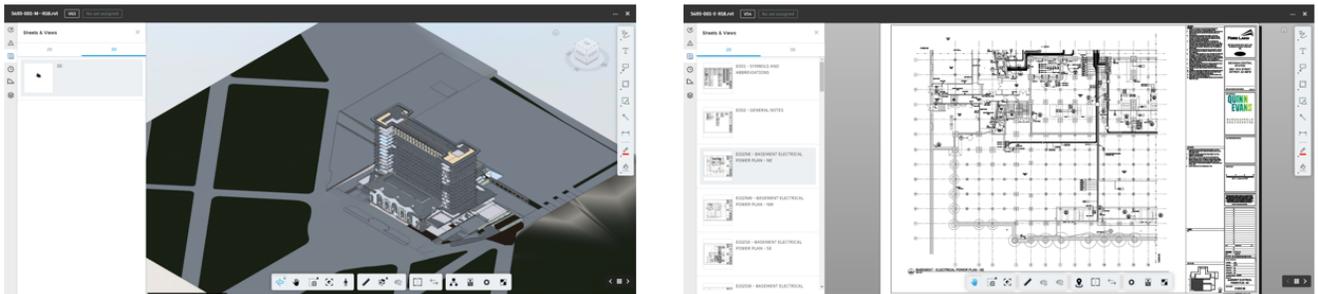


Figure 4: Model viewer tools in Document Manager. On the left is a 3D view of the latest version and on the right is a sheet view which can be marked up for review.

## Creating Effective Organization

As any BIM manager knows, the best way to keep a Revit model running smoothly is to have clear organization in families, views, worksets, and browser. Without organization, the model quickly loses cohesion and is much harder to work in. The same principles apply to the BIM 360 web hub.

### Creating a Template

Just as you can create a Revit template for reuse, there is also an option to create a BIM 360 hub template. This is definitely a tool to take advantage of so that you, as a BIM manager, always know that new project hubs are setup in a format familiar to you. Through the template you can setup standard file organization and activate the services which your team frequently uses like Document Management and Design Collaboration.

## Team Members & Permissions

Being a Project Admin of a BIM 360 hub allows for the addition of new team members and control over project permissions. As best practice when adding new team members, always be sure to fill in the appropriate fields of Company and Role. This will make it easier to assign permissions later on when choosing whether to grant access to folders or services

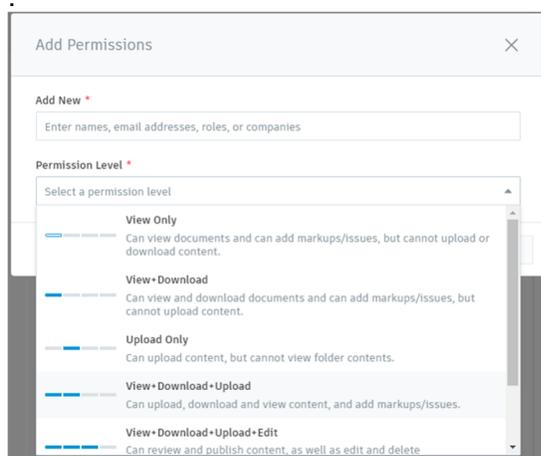


Image 5: Folder permissions options.

There are different levels of permissions which should be carefully considered when being assigned across the team. Knowing what role an individual or company has in the overall project team informs what kind of access they should have within the project hub. An owner or high level PM who does not need access to Revit model but would like to be able to view the 3D views can be assigned to View Only. Designers who are actively modeling need to be granted View+Download+Upload+Edit for the folder where their model is located. Understanding how best to assign permissions is integral to ensuring that a project hub runs smoothly.

## **Folder Structure**

In Document Manager, it is best to create a clear folder structure which can be easily understood by not just yourself but any member of the team who can access the project hub. A BIM manager will not always be immediately available to walk new members through the folders and having an easily followed structure reduces the risk of files ending up where they should not. This also makes it easy to make edits to the folders as the project needs grow should new companies, teams, or requirements change. Typically for projects where Buro Happold is the main hub owner we organize first by company then by discipline, a process that is easily replicated and broken down.

## **Supporting BIM 360 Cloud Teams**

As a BIM lead of now multiple projects hosted through the cloud one of the best ways I have found to support my team is through frequent training and support documents. Part of the standard Revit project lifecycle at Buro Happold is to have regular BIM meetings. First is a kickoff meeting at project start where the whole team is taken through standard file organization, model hosting, and any unique characteristics of a project. If any team members need additional training due to inexperience or to take on more responsibility they would be identified at this time. Additional project BIM meetings would also be held at the start of DD and CD phases to ensure that the team continues to perform optimally and that all BIM needs are being met.

After taking a team through training, having a reference document as a support is best to have filed away somewhere easily accessible. Typically I would place copies of these reference files in the company project folder as well as on the BIM 360 hub.

## **Conclusion**

Having now spent a few months fully working with BIM 360 Design, I can say that the switch has been mostly positive for the US region. Our project teams have been able to continue working from home with little negative impact to their ability to meet deadlines. The results have been so well received that after an internal company presentation the rest of the company is beginning a global adoption of BIM 360 Design as well. Looking forward we will continue and adapt our workflows around integration of BIM 360 services.