AUTODESK UNIVERSITY

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Using BIM 360 to Coordinate All Your InfraWorks Assets

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Learning Objectives

- Learn how to integrate InfraWorks into a BIM 360 workflow
- Learn how to coordinate user permissions for collaborative workflows inside and outside your organization
- Learn how to share your InfraWorks model and all the supporting assets

  Learn how to use the Large Model Viewer to view your InfraWorks models

Description

With the recent addition of BIM 360 support to InfraWorks software, collaborating on your infrastructure projects has become both easier and much more powerful. This session will focus on the basics of the “BIM 360 to InfraWorks” workflow, including sharing your model, synchronizing, using the Large Model Viewer, and setting up permissions for the team. We will also explore how to use the collaborative power of BIM 360 to share all of your InfraWorks assets, such as geographic information system (GIS) data sets, AutoCAD Civil 3D files, Revit files, 3D models, overlays, scripts, and other support content.

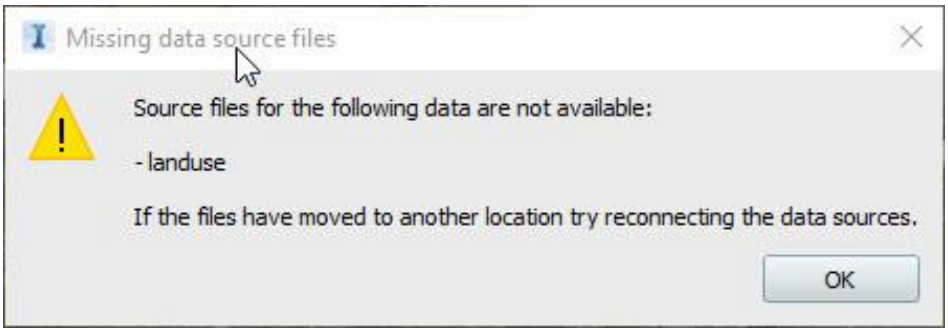
Speaker Bio

Mark Kauffman’s career stretches back to the wild and wooly days of the early 1990s in the computer animation world. In 1995 he co-founded Paradigm Ranch Animation Studios, working on movie and television projects. In 1998 Mark joined the faculty at The Art Institute of Colorado, training students in the animation, graphic and web design, industrial design, and video production programs until he left in 2012. In 2003 he joined the Project Visualization Group at Parsons Brinckerhoff (PB), now WSP, serving as the team’s technical lead. As lead he manages all technical aspects of production, manages the render farm, and oversees the group’s research and development and new technology initiatives. In addition to his duties with the Project Visualization Group, Mark serves as a certified 3ds Max software trainer in WSP’s Autodesk Training Center, and is the president of the Colorado AAUGA group.

Introduction

Early in the development of InfraWorks, even back when it was Infrastructure Modeler, Autodesk intended it to be a collaborative tool, providing small and large teams a centralized location where they could coordinate their design concepts. With the introduction of cloud collaboration, design teams could share an InfraWorks model with multiple users and coordinate modeling tasks inside and outside the local network. While this is a powerful feature, there has always been a significant downside to sharing a model; sharing the original assets.

If you create an InfraWorks model using the Model Builder, it will acquire assets from a myriad of different sources, specifically USGS, Bing and Openstreetmap, and compile these into a model for download. Here's the catch. Have you ever tried to open the coverage data in the Data Sources palette? You will be presented with this nifty error message (Figure 1)



Anybody who is collaborating with you on your model will receive this for virtually any model they work on, unless the model assets are mapped to a centralized file server within your organization. With the advent of more cloud based file sharing tools such as Box, Onedrive, Dropbox and others, this can be managed a bit more between larger groups. Unfortunately, many of these tools lack some of the backend collaborative project based capabilities of BIM360.

The goal of this presentation is to familiarize you with a series of workflows I have developed when collaborating on an InfraWorks model. Let's get started.

BIM360

So why BIM360? I have chosen this platform for several reasons, but here are a few main points.

1. Many of the data assets which you can upload to BIM360 are viewable via the Large Model Viewer (LMV).
2. It was designed to facilitate sharing and collaborating on small to large AEC/BIM projects.
3. It provides good tools to manage user access privileges and only requires a simple web browser to access your project resources (no special software to install and manage).

I do not want to go too deep into the ins and outs of BIM360 management, but we will cover the basics, so let's quickly walk through the process of creating a BIM360 Docs Project, as this works best for sharing content with InfraWorks.

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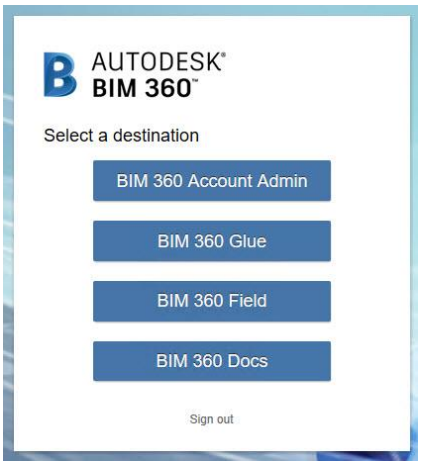
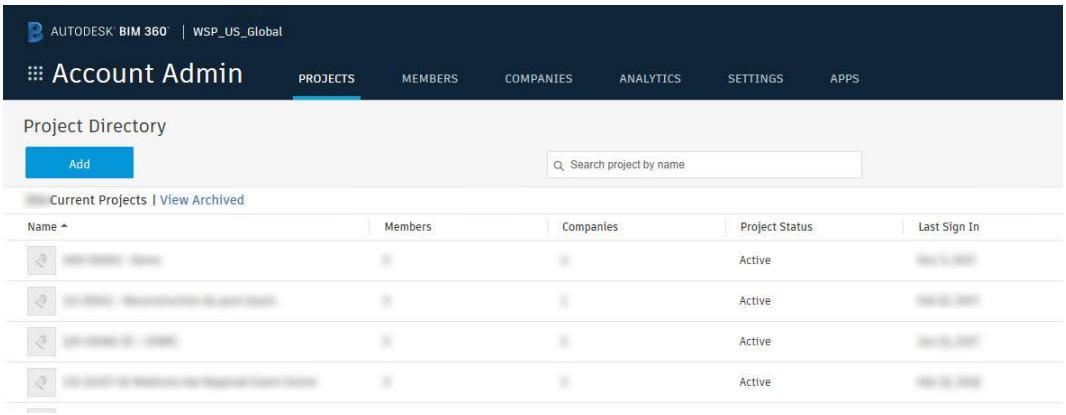
Create a BIM 360 Project

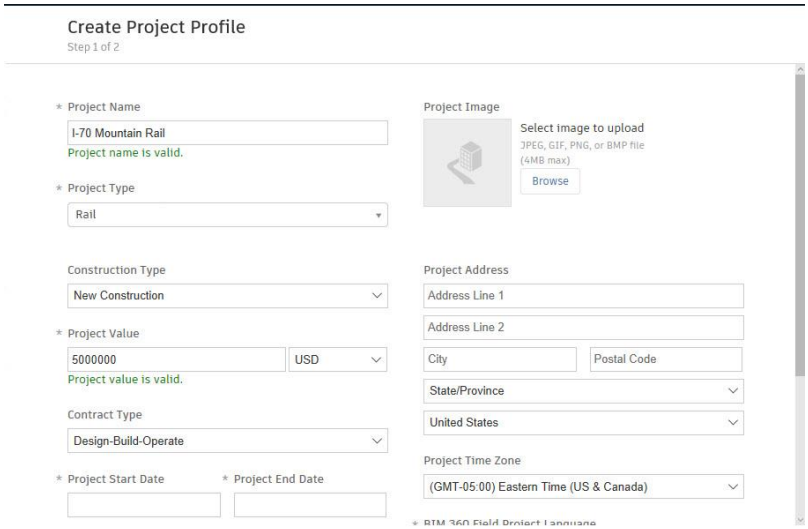
Log into your BIM360 account. Depending on what sort of BIM360 account you have, you might have access to multiple BIM360 types, such as Glue or Field. You will need to log in as an Account Admin to create a new project. (Figure 3)



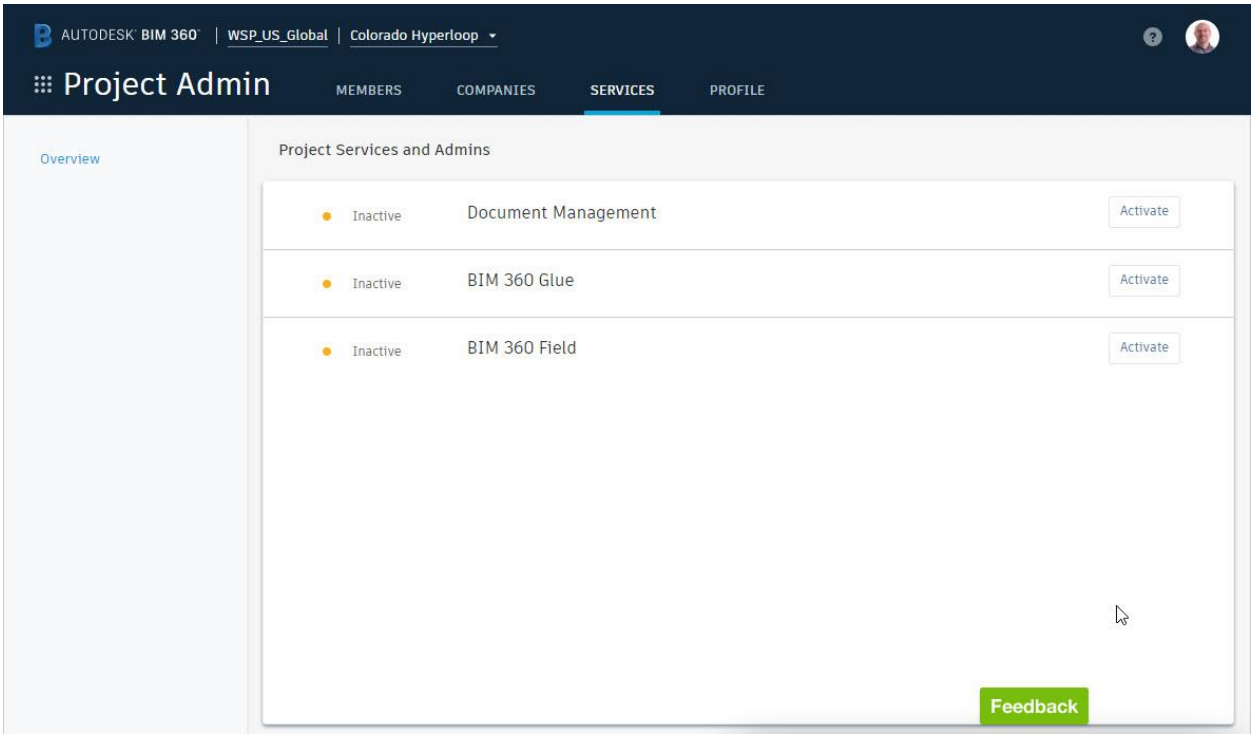
In the proceeding window, you will see a list of all the projects currently assigned under your account. Click the “Add” button under the Project Directory heading. (Figure 4)



In the next window, you will need to fill in a series of elements pertaining to the project. It is only necessary to complete the fields with the * (asterisk) next to them. (Figure 5)



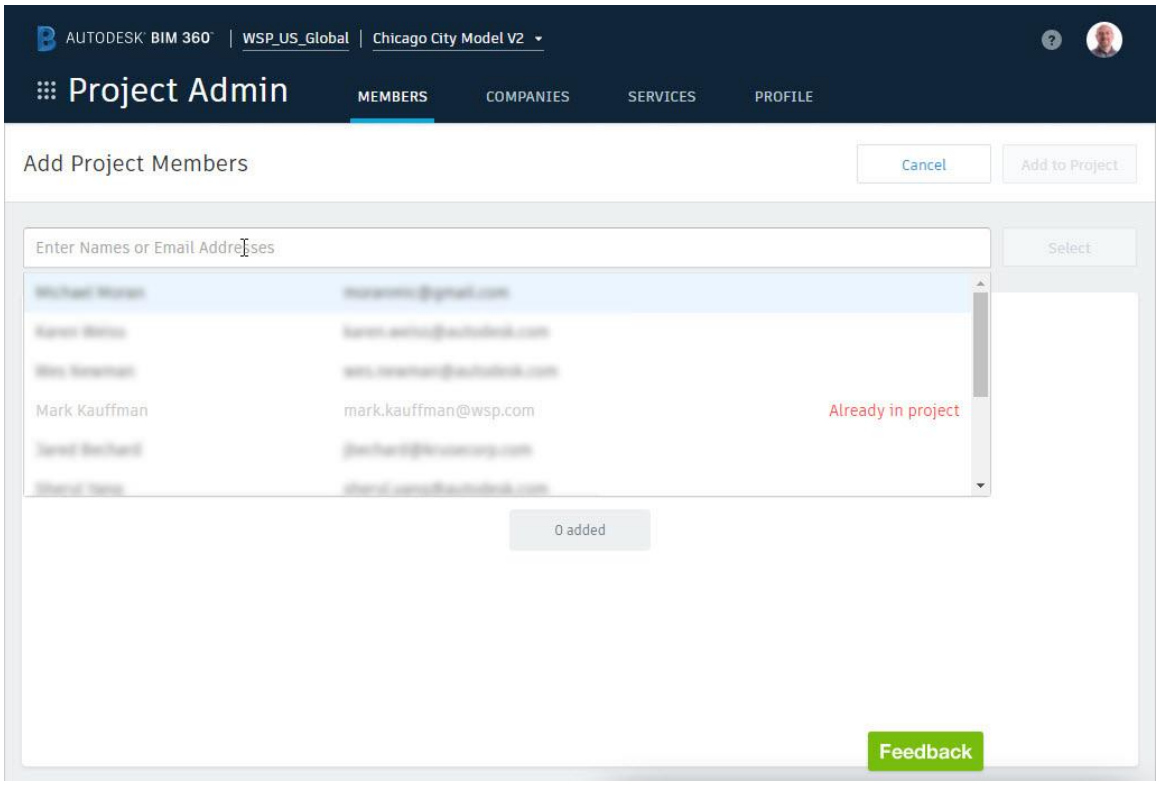
Next up, you will need to select the type of project service to provide (Docs, Field, Glue, etc.), select Activate for Document Management. (Figure 6).



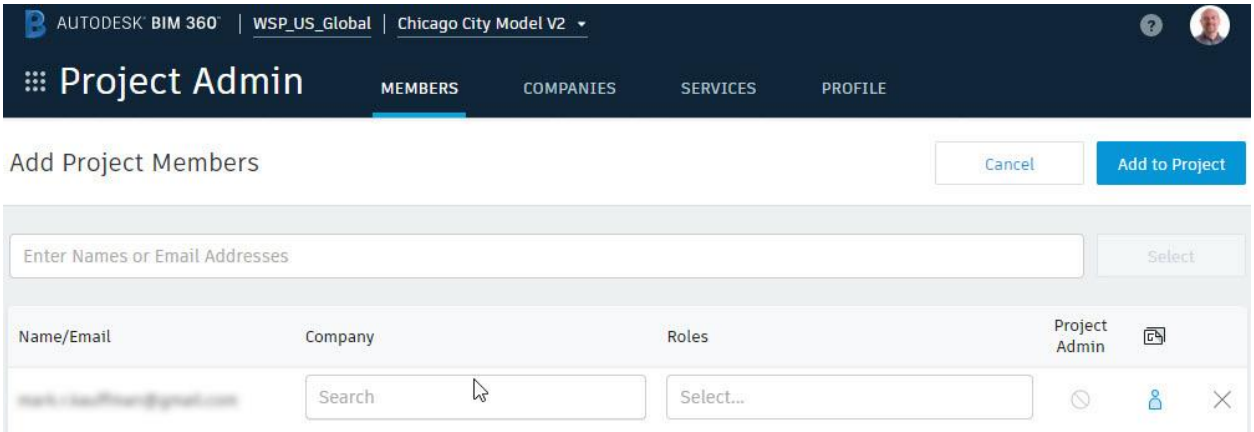
Once the Activate button is clicked, you should specify the project admin(s). The admin is effectively your project “super user” and can manage all aspects of the project. I would highly recommend this person configure their Autodesk account to utilize 2-factor authentication for an added level of security. Now that your project is created you need to add some users.

Adding Users and Assign Roles

Select your project in the list of the Project Admin window. (See Figure 4) You will see an “Add” button, which will take you to the next windows where you can add users. If you click in the “Enter Names” field, BIM360 will pop up a list of previously added users for quick selection. (Figure 9)

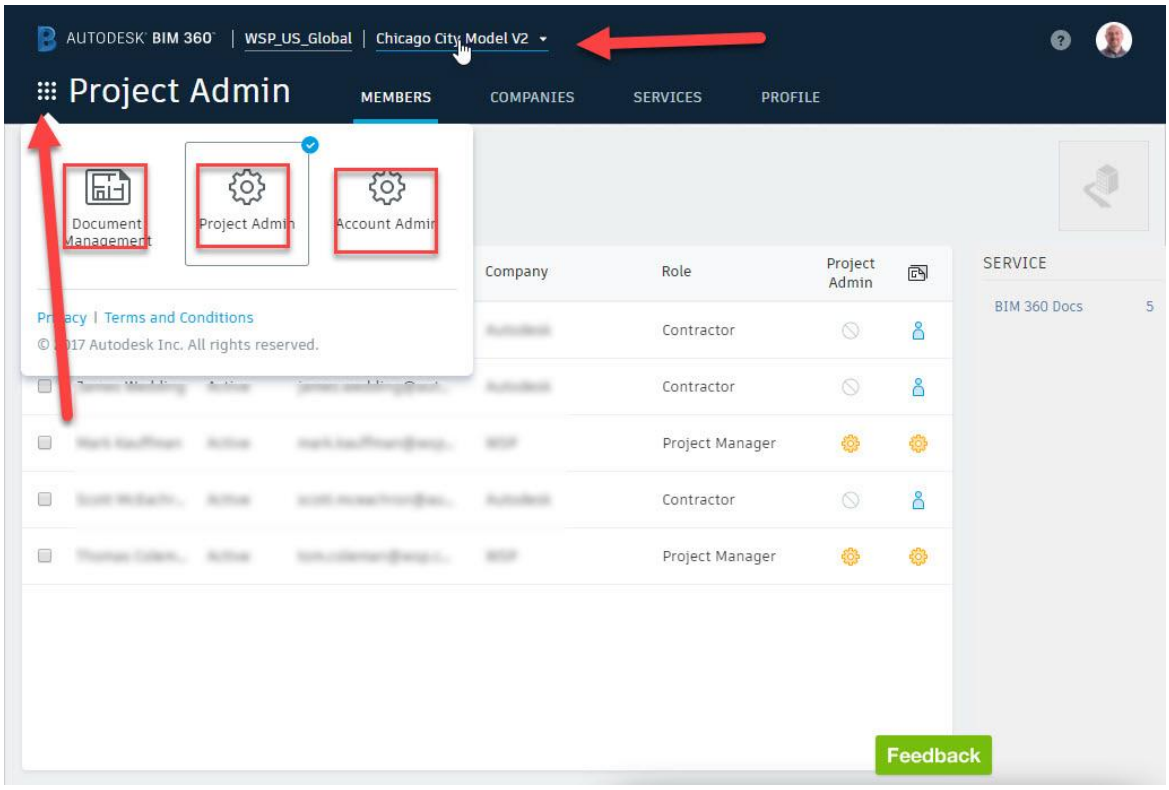


Otherwise, you can type the new user’s email address and click the Select button. In the proceeding window, you can type in the new user’s Company and Role information. (Figure 10)

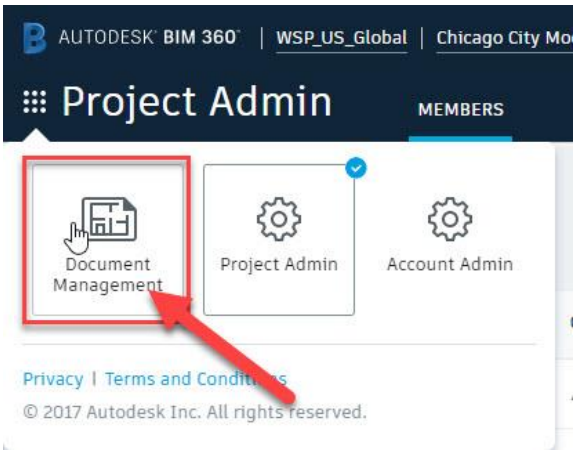


Tip:

A quick way to navigate between different management levels within the BIM360 site is to use the dropdown and management menus. (Figure 8).

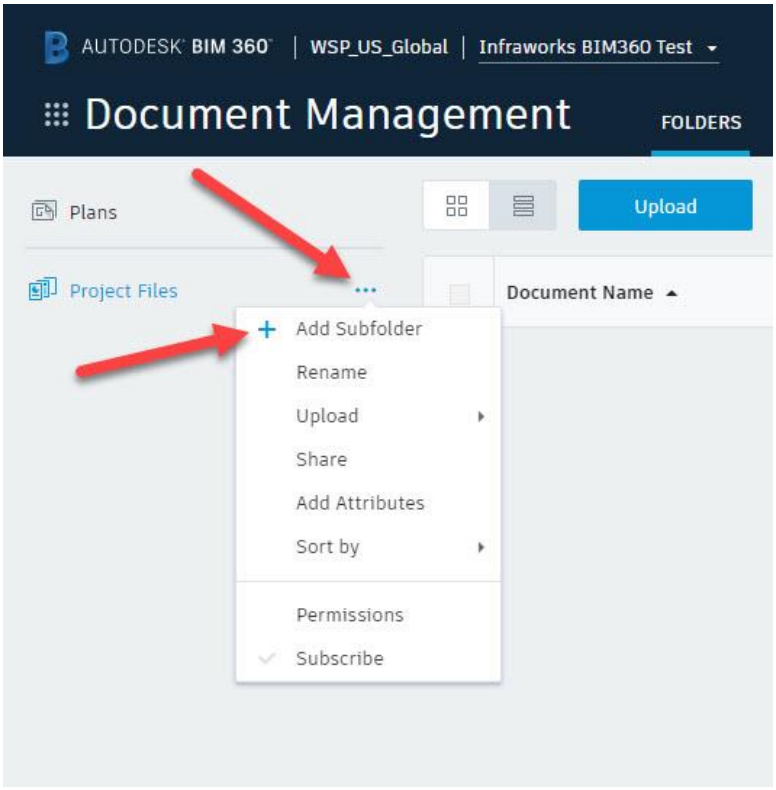


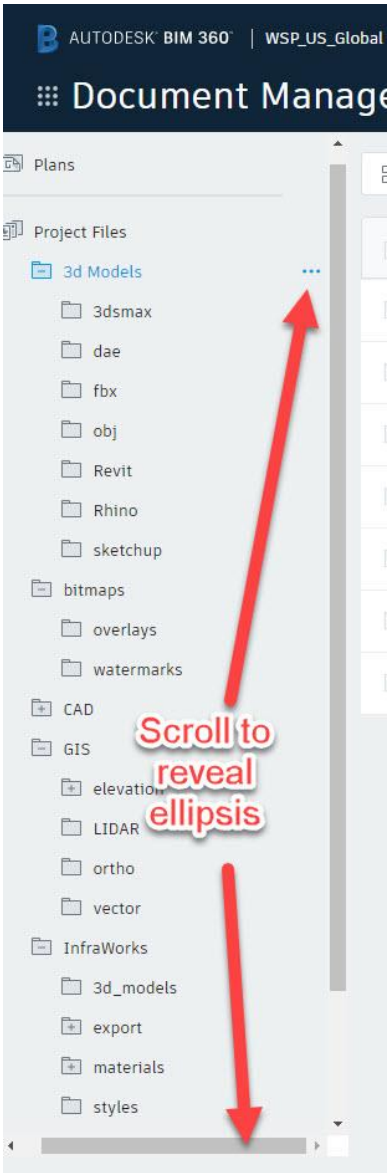
Having a role and company attribute assigned to each user provides an added level of administration to the project site. For instance, you can specify all Company XYZ employees have access to data in the CAD folder, but everybody else has either limited on no access to this folder. This would be similar to the way you set permissions on project folders located on your local server. Ok, we are ready to set our project file structure. Click the Menu icon in the upper left corner and select “Document Management”. (Figure 11)



Create a Folder Structure and Assigning Permissions

Creating the folder structure is straight forward in BIM360 and, as I stated earlier, like the way you assign permissions on a file server. Each folder would have a name and each user would have varying levels of access. You will see 2 options in the Document Management window, Plans and Project Files. To add a new folder, click the ellipsis to the right of "Project Files". In the proceeding contextual menu, click the "+ Add Subfolder" option. (Figure 12)

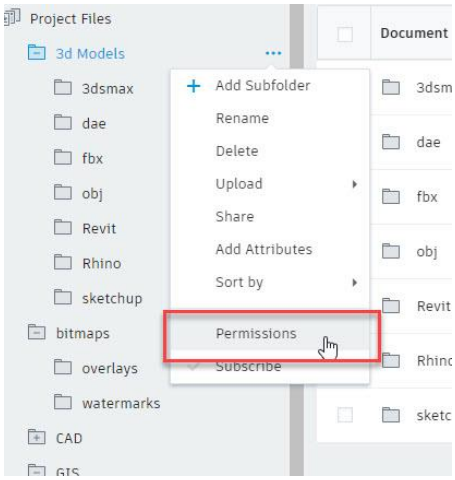




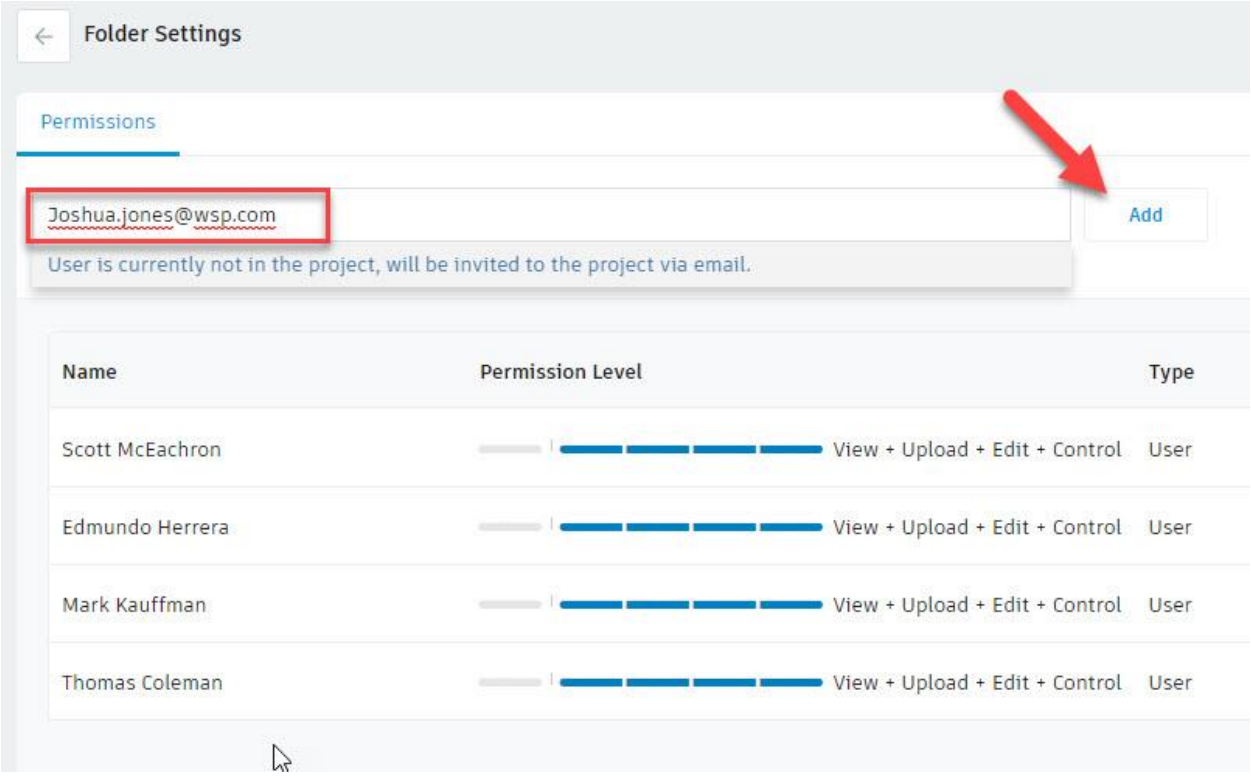
The disposition of your folder structure is unique to every user and every project, but in this example, I will create the typical folder structure I use for sharing InfraWorks assets. (Figure 13)

Please note, often the width of the folder names will cause a horizontal scroll bar to appear at the bottom of the Project Files column. To access the contextual menu, you will need to scroll the horizontal bar to the right to reveal the ellipsis next to each folder name. Believe me, this stumped me for a good 15 minutes when I created my first project folder structure.

In the resulting contextual menu, select Permissions. (Figure 14)



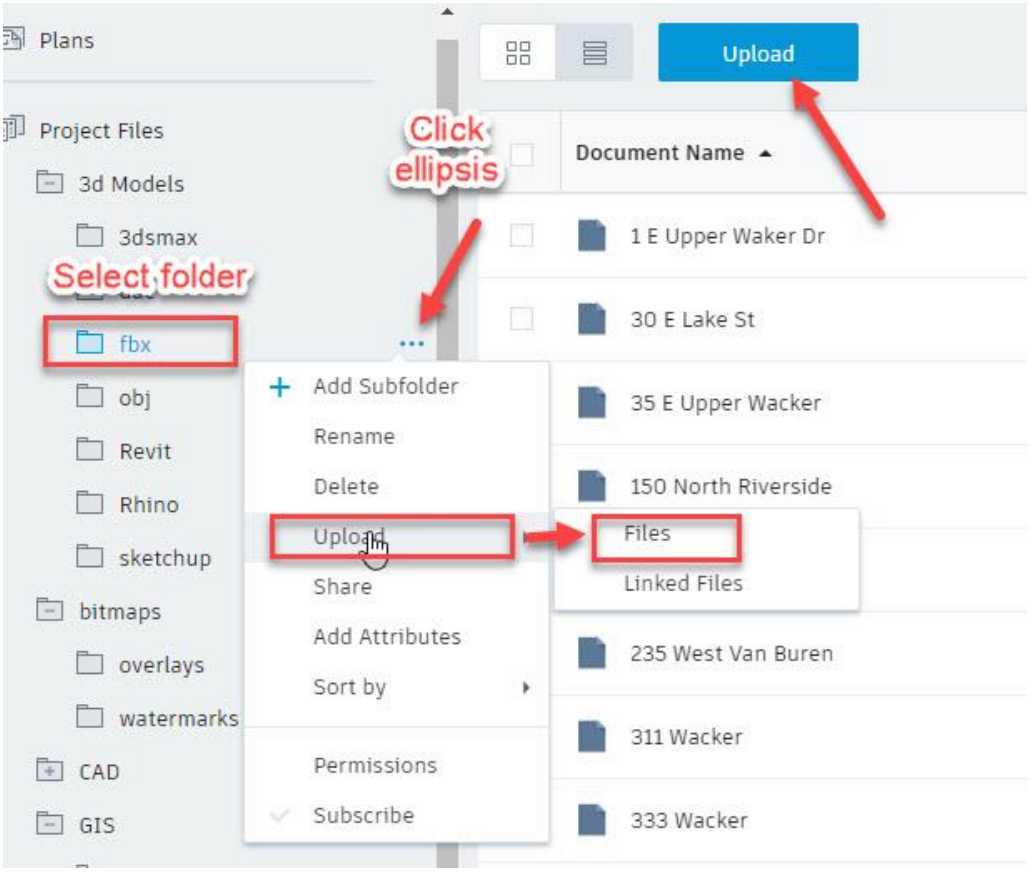
In the next window, you can add users and adjust the access privileges. If the user has not been added to the project yet, you can type the user's email address and an invitation will be sent out. Please note, you can enter multiple users in this field. Once completed, click the "Add" button. (Figure 15)



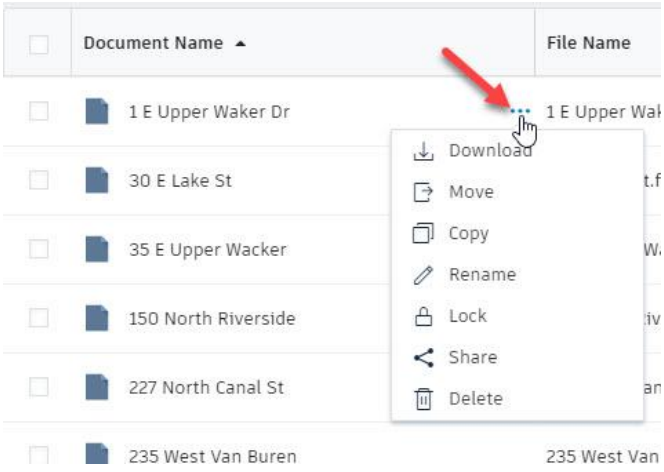
Once the user is added, you can change their permission levels. As you mouse over each level, you will see a tool tip indicating the permission type and the text will change in the column next to the blue lines. Note, the first option is Upload only. (Figure 16)

Uploading Files

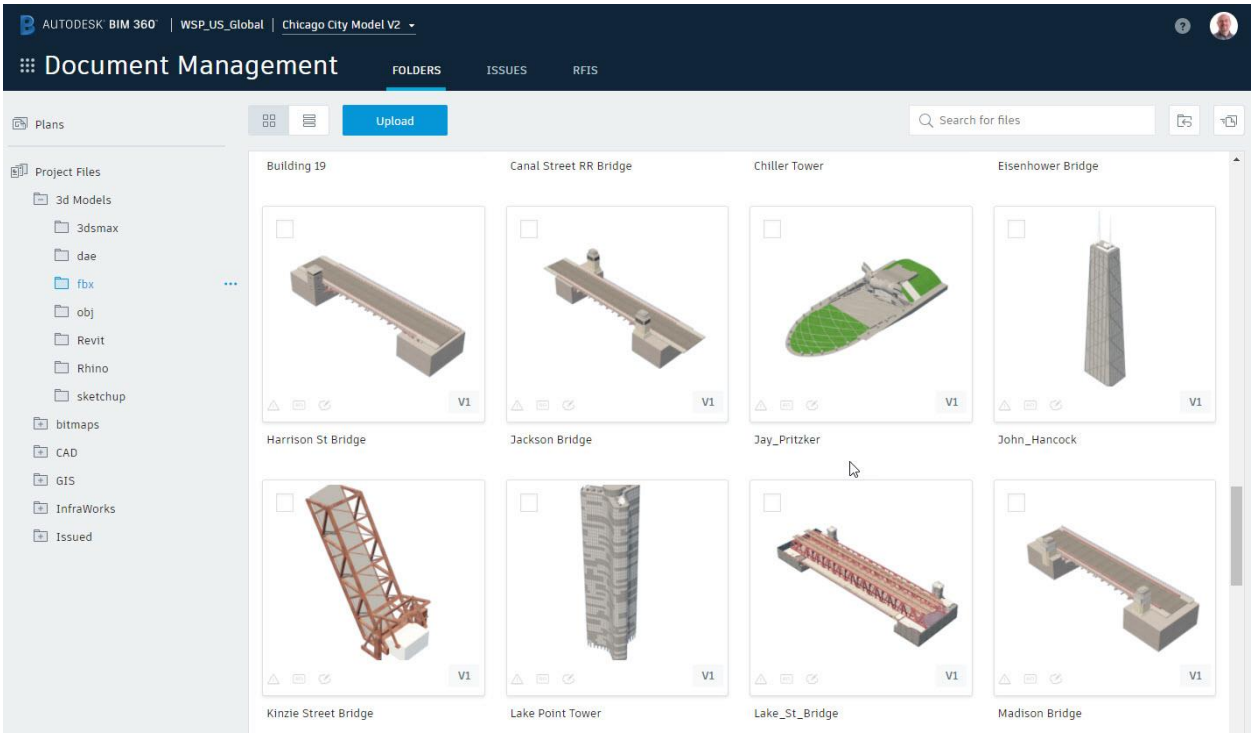
Now that you have created your file structure and added the appropriate users, you can begin uploading content. As you saw in the folder structure (Figure 13), I created folders for 3D models, GIS, CAD, an InfraWorks folder and several others. To upload, select the folder you which to upload to and click either the ellipsis and select “Upload” from the contextual menu, or click the “Upload” button at the top of the folder window. (Figure 17)



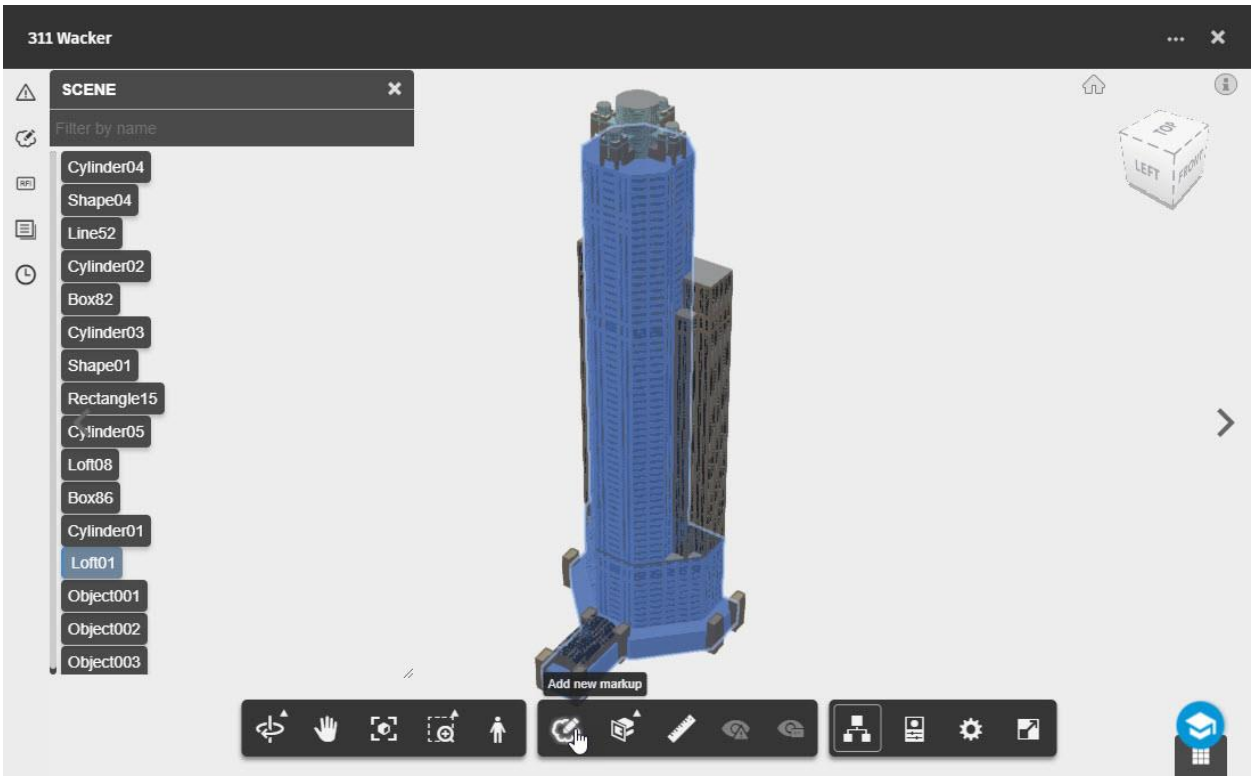
There are a myriad of options once the file is uploaded to BIM360. To access, click the ellipsis to the right to the file name and select and option. (Figure 18)



While you can upload nearly any type of file, BIM360 has the ability to read and display certain types of files. As you can see, all of the FBX files in this folder can be viewed in the LMV. (Figure 19)



Clicking on a file icon will open the LMV window, where you can explore the specific file. (Figure 20)



Here is a list of the type of files, which BIM360 can read and display:

Viewable 2D and 3D design file formats

3DM	3DS	CATPART	CGR
DLV3	DGN (3D ONLY)	DWF	DWFX
DWG	DWT	DXF	EXP
F3D	FBX	G	IFC
IGE	IGES	IGS	IPT
MODEL	NEU	NWC	NWD
PRT	RVT	SAB	SKP
SLDPRT	SMB	SMT	STEP
STL	STP	X_B	X_T

Viewable media file types

JPG

PNG

PDF

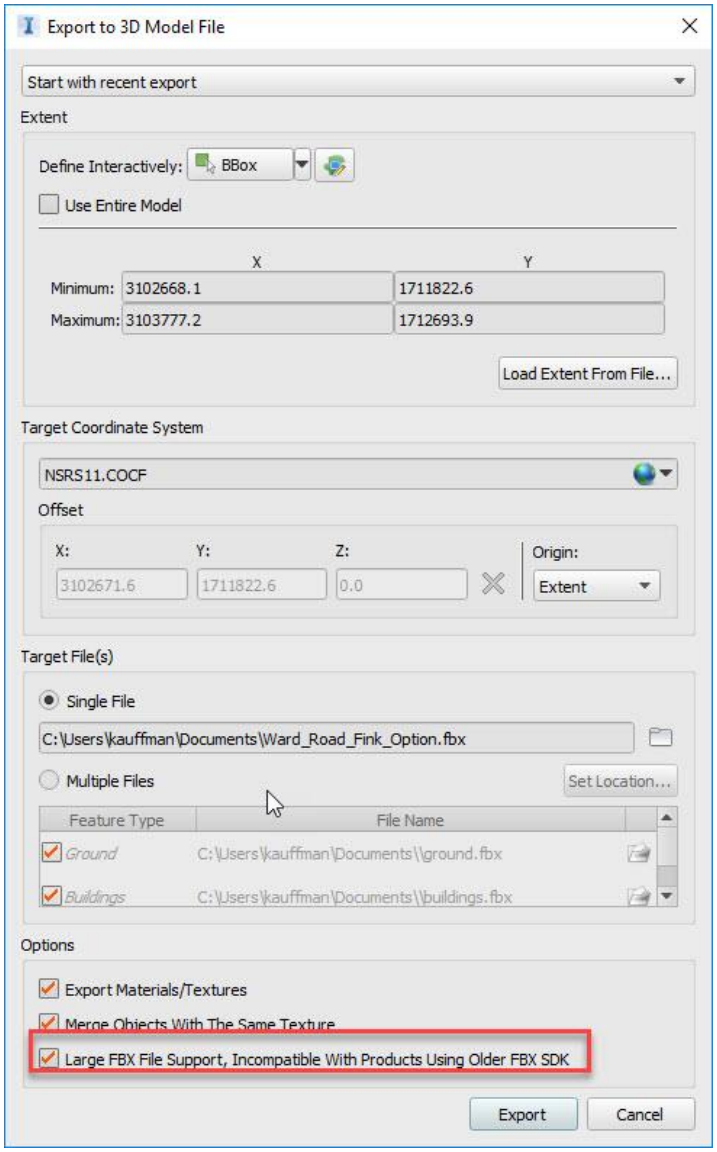
Workflows

Large Model Viewer (LMV)

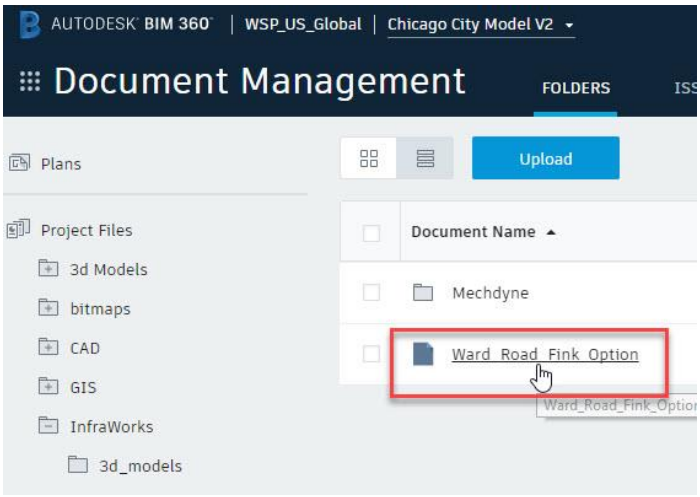
We have already seen an example of the LMV above, but let me walk you through a workflow I have developed for showing sections of your model in the LMV. This involves exporting a “chunk” of your model in an FBX format and uploading it to BIM360. The LMV is significantly more reliable than the current Scenario and Web share functionality in InfraWorks and I have found it to work better with standard web browsers such as Chrome as well as the BIM360 app on the Android and iOS platforms.

To start, you need to export your model to FBX. Go the Settings and Utilities menu, select Export 3D Model. (Figure 21)

In the Export dialog, you will need to draw a selection around the area you plan to export and set any particular export options such as target coordinate, file location, etc. Also, make sure you select the option “Large FBX Support” (Figure 22)



I would recommend creating a custom coordinate system to be used with all your non-geospatial models. You will notice a GIS folder in my Project Files. It is here where I place the custom coordinate text file, which allows you to exchange with all your project collaborators. If you would like to learn more about how to build custom coordinate systems for your projects, you can look up my class from AU 2015, AV11500 - Effective Coordinate Space Transformation Workflows.



Once the FBX model is exported, you can upload it to the project site, where BIM360 will convert the file into a format necessary for the LMV. This will usually take a few minutes to an hour, depending on the complexity of the model. Once uploaded, simply navigate to the file in your project and click on the file to view it in LMV. (Figure 23)

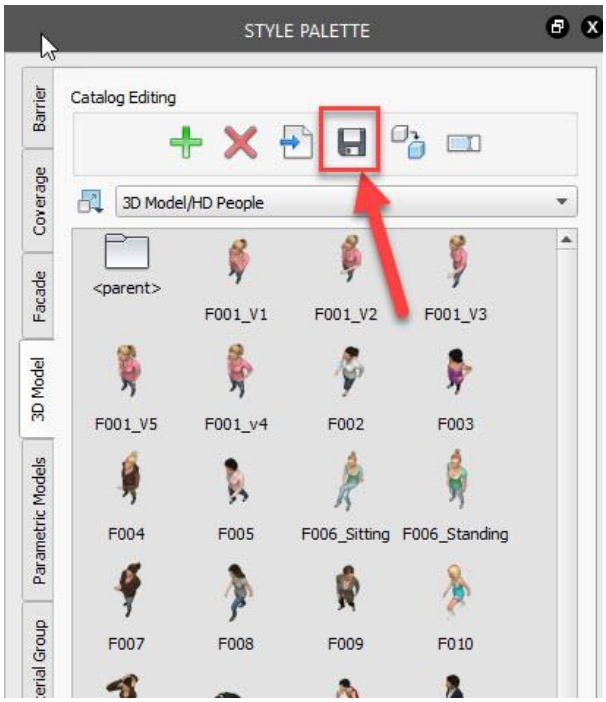
LMV provides a host of tools to mark up, measure, slice and visualize your model.

(Figure 24, 25, 26, 27)

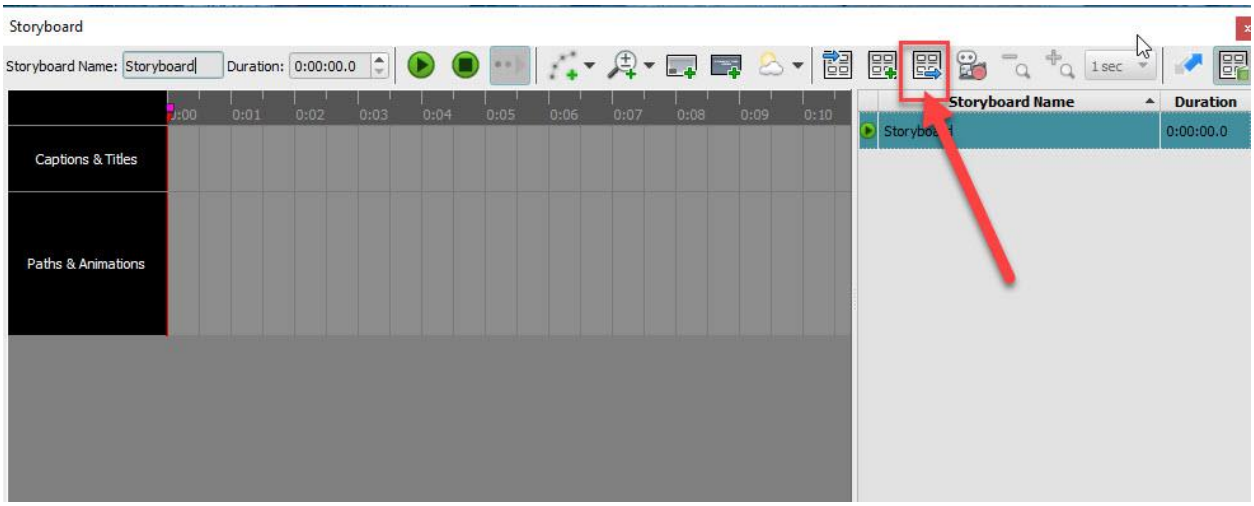
Sharing InfraWorks Assets

Here is an area where I have found BIM360 to be very useful; InfraWorks specific assets. What is an InfraWorks specific asset. Well, pretty much anything located in the Style Palette can classify as an InfraWorks asset. Also, storyboards can be saved as well as Bookmarks.

I recommend creating an “InfraWorks” directory with sub folders for styles, materials, storyboards and bookmarks. To export your assets in the Style Palette, you can use the export function in your respective style group. In this example, I created a custom Style Catalog called HD People in the 3D models style tab. To export this for use on another model, click the export button in the top row of icons. It is important to note, this only works with a custom group of items, not the default content that ships with InfraWorks. (Figure 28)



To export a storyboard sequence, you can use the Export icon in the top bar. (Figure 29)



To export bookmarks, you need to navigate to the project folder, usually in your User folder. Here is an example: C:\Users*username*\Documents\Autodesk InfraWorks Models\A360\(5 digit number)\Ward Station Vision.files\unver\Bookmarks\. If you need to search, just look for the "unver" folder and located the Bookmarks folder therein. You can copy the *.JSON files to BIM360.

InfraWorks Model Storage

This last workflow option is a bit clunky, but I have found it useful from time to time when trying to synchronize an InfraWorks model. It requires the user to ZIP the entire model located in your InfraWorks Models folder, and upload it to a folder on the BIM360 project site. Once zipped and uploaded, any of the authorized users can download the model to their respective InfraWorks Models folder on their local drive and subsequently open it in InfraWorks without the download and sync process. It is important to only share the model with somebody who has already been provided access to the model via the InfraWorks cloud sharing tools. Otherwise, opening the model can cause some odd issues.

I have also found this as a good longer term storage method for InfraWorks models. In essence, this is an archival process, which helps to free up some of your cloud storage space to make way for new models.

Wrapping it up

The steps outlined in this document should help to significantly augment your InfraWorks sharing and workflow across a project team. While the folder structure I have detained above has worked well for me and my projects, I urge you to utilize a folder structure best suited to your needs. Only the general methodologies for creating the project folders, assigning user accounts and permissions, uploading and downloading files, and the use of the BIM360 tools such as LMV would be the same for all users.

I am sure the process of integrating InfraWorks with BIM360 will become more standardize via some native connections in the near future. In other words, you will see BIM360 tools built into InfraWorks soon and much of this will become more automated. Until then, you now have an effective way to share InfraWorks and all your project assets with your project team.