

AS223190

Harnessing Next Generation Cloud Collaboration – BIM 360 Design

Matt Dillon

Applied Software Technology, Inc.

Learning Objectives

- Set up a BIM 360 Project and work with teams and permissions to control file access
- Utilize Revit Cloud Collaboration and the Desktop Connector
- Understand how to effectively use Design Collaboration Workflows
- Troubleshoot the most frequently encountered problems with BIM 360 Design and Revit Cloud Collaboration

Description

In the Spring of 2018, Autodesk introduced BIM 360 Design, based on the Forge platform and BIM 360 Document Management. While users still have access to the legacy BIM 360 Team technology, BIM 360 Design provides enhanced collaboration workflows, more control over file permissions and much tighter integration with BIM 360 Docs for use in "downstream" collaboration workflows during the post-design phases of a project. This class will focus on the enhanced workflows possible with Design Collaboration and Revit Cloud Collaboration, and will cover project set up, teams and permissions, and the use of packages to effectively control when others have access to your data and when data from other teams is updated in your model. We will also look at common troubleshooting techniques and BIM 360 Site setup.

Speaker

With a background as a registered architect, Matt Dillon has over 30 years of experience in Autodesk Architectural applications and is an Autodesk Certified Instructor at an Autodesk Authorized Training Center. In addition to assisting customers implement Building Information Modeling (BIM) and Revit Platform products, Dillon has also consulted with Autodesk, Inc., development staff in product design and usability for AutoCAD Architecture software. A published author, Dillon was one of the recipients of Autodesk's Distinguished Speaker Award in 2010, and he has been a highly rated instructor at Autodesk University since he first began presenting in 2000.

Introduction

Revit's out-of-the-box worksharing capabilities are well suited for allowing multiple users to work in the same Revit project at the same time, as long as the central model is stored on a local file server – on a Local Area Network (LAN). However, attempting to access a central model (“Central File”) across a Wide Area Network (WAN) is problematic at best. Autodesk provides Revit Server technology for use on WAN-hosted Central Files, however it requires a significant investment in hardware, usually involving the investment in extra file servers, and significant IT resources to set up, configure and manage. For design teams that comprise multiple organizations, and who cannot work behind the same firewall, collaboration on a Revit Central File was even more troublesome for quite some time. Even Revit Server was not a good solution for those situations. There were a variety of 3rd party solutions that created a virtual cloud-hosted environment, in which not only was the Central File hosted in the cloud, but Revit itself ran in the cloud. This also involved a significant expense in hardware and IT resources, either directly if done using internal resources, or indirectly by renting space on a 3rd party provider's virtual cloud server and workstations.

A Short BIM 360 History Lesson

- In January of 2015, Autodesk released its answer to the problem of cloud collaboration for geographically disperse project teams (whether inside or outside the same organization): *A360 Collaboration for Revit*, which included a web-hosted project repository or “Team Hub”, where Revit models could be hosted (BIM 360 Team), and a plugin for Revit that allowed for the storage and access of Revit Cloud Models, along with the worksharing features required when multiple users are working in the same project simultaneously.
- In the summer of 2016, Revit 2017.2 was released, which included the plugin as a part of the initial Revit installation (it still needed a valid A360 Collaboration for Revit entitlement to work however). Stability and reliability had also improved substantially by this time.
- On April 9, 2018, Autodesk discontinued sales of BIM 360 Team and A360 Collaboration for Revit, replacing them with BIM 360 Design, which includes Revit Cloud Collaboration. This initially resulted in some confusion among existing and new users. With the discontinuation of BIM 360 Team, what would happen to legacy projects? Fortunately, the answers turned out to be simple – and benign. BIM 360 Team and A360 Collaboration for Revit are still available to existing and new users – they are included with the purchase of BIM 360 Design. Existing users now also have the option of using BIM 360 Design on new projects. *Which platform you can use is determined by the version of Revit that you're using on your project:*
 - **Revit 2018.2 and prior** – BIM 360 Team and A360 Collaboration for Revit are the only options.
 - **Revit 2018.3** – You can choose to use *either* BIM 360 Team and A360 Collaboration for Revit *or* BIM 360 Design.
 - **Revit 2019** – BIM 360 Design is the only option.

Note: *The Communicator application, which runs as a supplement to A360 Collaboration for Revit and provides feedback as to synchronization with central operations, as well as a tightly integrated instant messaging tool, is no longer available with BIM 360 Design. When working on a BIM 360 Team project, it will still be available, however.*

BIM 360 Team vs BIM 360 Design

There are significant differences between BIM 360 Team and BIM 360 Design:

BIM 360 Team	BIM 360 Design
“High Trust” environment	Configurable permissions
Minimal notifications	“Issues” with email notifications and “subscribed to” folders with email notifications
Stand-alone – no connection with BIM 360 Docs	Includes the Document Management service (next generation BIM 360 Docs)
Sharing of data is automatic	Data sharing and consumption is controlled through the Design Collaboration workflow

In short, the main differences between BIM 360 Team and BIM 360 Design can be summed up in one word: **Control**. In BIM 360 Team, any project member that can edit one Revit file can edit all Revit files. There is no way to control access to files and folders on an individual or team level. In BIM 360 Design, however, users are assigned to teams, which have specific permission levels in the project folders, based on their role and their relationship to the folders. While these permissions are completely configurable, the use of teams allows for them to be simplified and automated to a great extent.

BIM 360 Design Project Setup

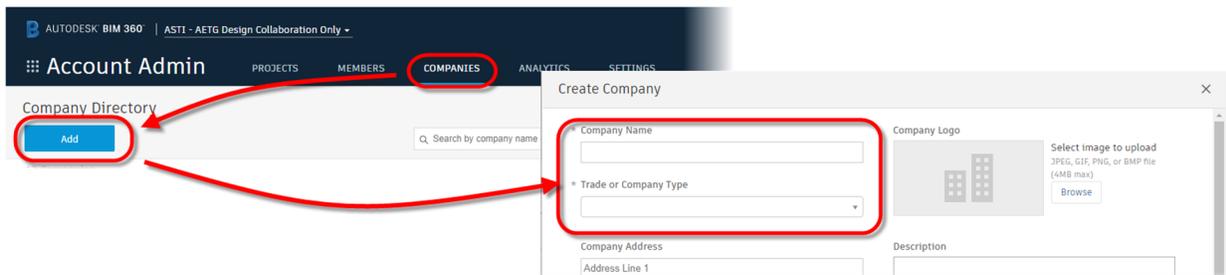
Account (Site) Administration

Before creating your first BIM 360 Design project, there are a few things you should set up on your site. You will need to be logged in as a site (account) administrator.

1. Navigate to the Account Admin page if you’re not already there. There will be a series of categories listed across the top of the page: “Projects”, “Members”, “Companies”, “Analytics” and “Settings”.
2. Click on the “Companies” link.

It’s a good idea to add any companies that will be participating in your projects. By assigning users to companies, you can automate the permissions that they will have on project files and folders.

3. Click the “Add” button in the Company Directory.
4. Fill in a value for “Company Name” and the “Trade or Company Type”. You can optionally fill in the other values as well.



You can also use the “Members” category to add members to the site for inclusion in projects later. This is a good idea if you have users that will be participating in several projects. When you add a user, either to the site or a project, you must specify a company for them.

Only a BIM 360 Design account (site) administrator can create a new project. For that reason, among others, it’s recommended that you have more than one site administrator. You can invite site administrators using the “Members” link.

Note: Official Autodesk terminology refers to your BIM 360 Site as an “account”. I find this to be somewhat confusing when talking to new users; for that reason, I frequently tend to refer to it as a “site” instead.

There are other aspects to the “Account Admin” page that you should explore, but once you have added the companies that will be part of your project, you can go ahead and create the project itself.

Project Profile

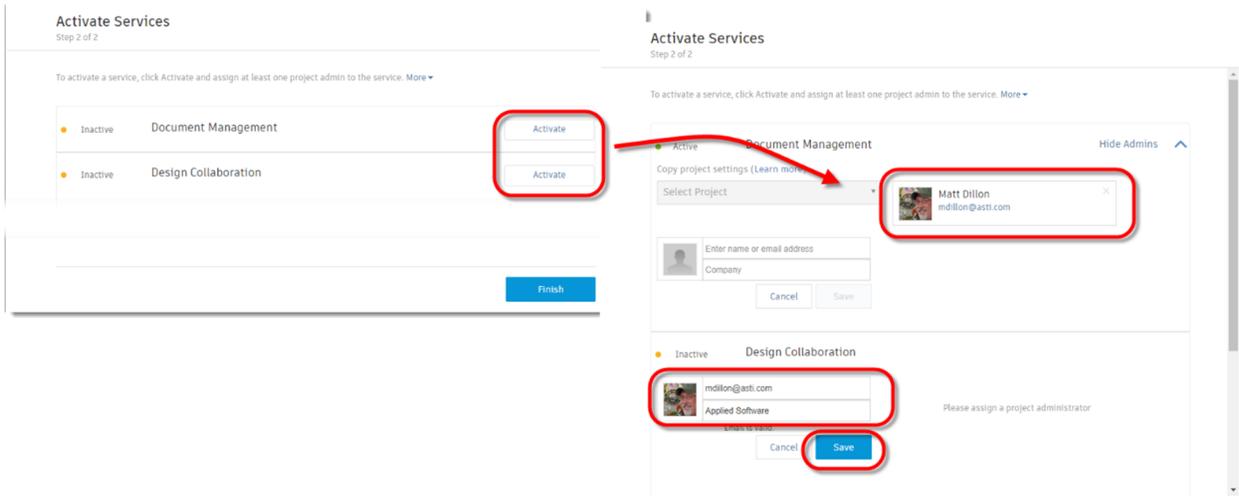
The first step in Project Setup is to establish the Project Profile. Remember that most of the information you provide here can be edited later.

1. In the main account page, logged in as an account admin, using the “Projects” link, click the “Add” button in the Project Directory.

The screenshot shows the Autodesk BIM 360 Account Admin interface. The top navigation bar includes 'PROJECTS', 'MEMBERS', and 'COMPANIES'. The 'PROJECTS' link is circled in red. Below the navigation bar, the 'Project Directory' section shows a table with 26 current projects and an 'Add' button, which is also circled in red. The 'Create Project Profile' form is displayed, with several fields highlighted in red boxes: 'Project Name' (AU 2018 - Sample Project), 'Project Type' (Office), 'Project Start Date' (Aug 18, 2018) and 'Project End Date' (Nov 16, 2018), and 'BIM 360 Field Project Language' (English).

2. Fill in, at the very least, the five required fields – the project name, project type, the start and end dates and the language, and click “Finish” (you’ll need to scroll down to find the “Finish” button”)
3. In the “Activate Services” dialog, which will appear next, you should see the “Document Management” and “Design Collaboration” services available for activation. Click on one of the “Activate” buttons. To activate each service, assign at

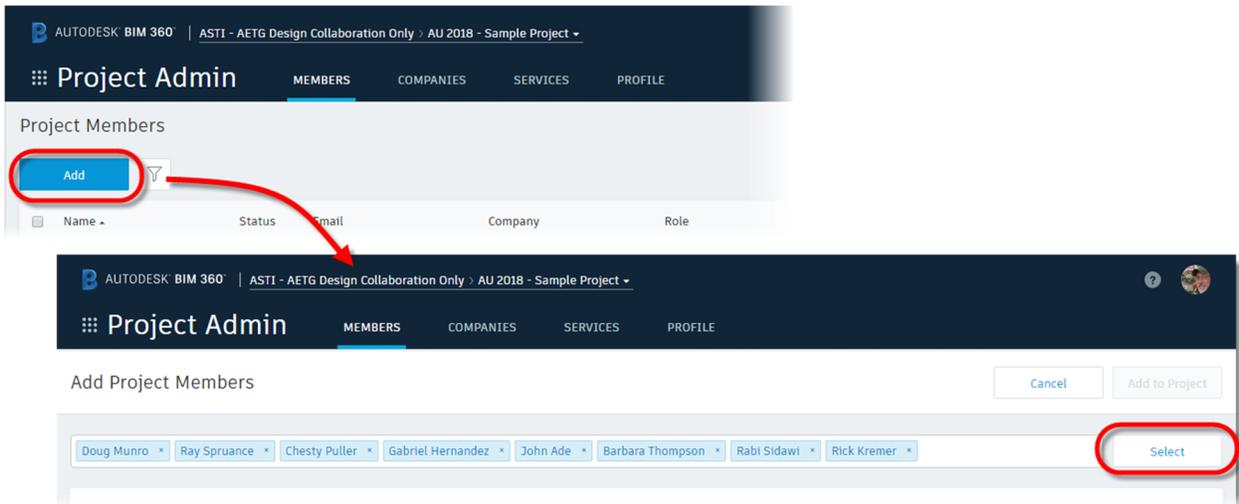
least one administrator for each service (again, you should consider having at least two administrators).



Note: You must activate services in order to begin working in BIM 360 Design, which requires the “Document Management” and “Design Collaboration” services. There may also be other BIM 360 services available for activation, depending on what your company has purchased entitlements to. You can always activate additional services later from the “Services” link on the “Project Admin” page.

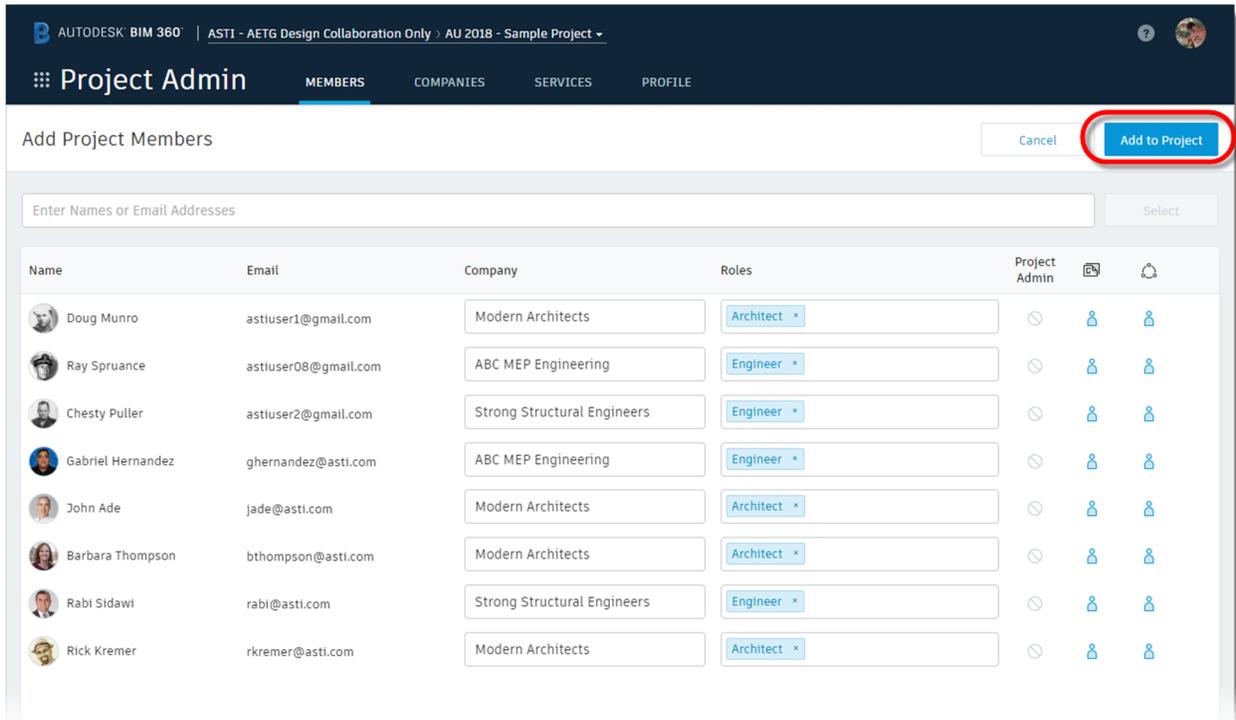
Project Members

1. Click on the project name in the Project List. You should be taken to the Project Admin page.
2. Click the “Add” button to add project members. Begin typing in user names or email addresses of your project members. You can add multiple members at one time as shown in the following dialog box. Click the “Select” button to move to the next step.



Note: If the members exist in the account already, you can simply enter their names. If not, you'll need to use their email address.

3. For each member, specify a company and a role. Again, this is to allow for automation of permissions and team membership in the next step in the project setup process. Note that you can also enable and disable the Document Management and Design Collaboration services for each user, as well as invite users as project administrators. By default, each user has access to both Document Management and Design Collaboration but is not an administrator.



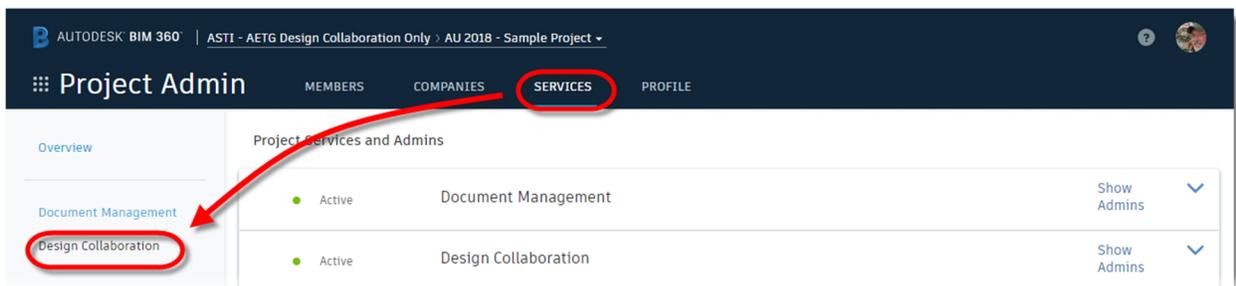
4. Click the “Add to Project” button to finish adding members to the project.

Note: Whenever you add a project administrator, site administrator or project member, that person will receive an email invitation with a link to the site or project.

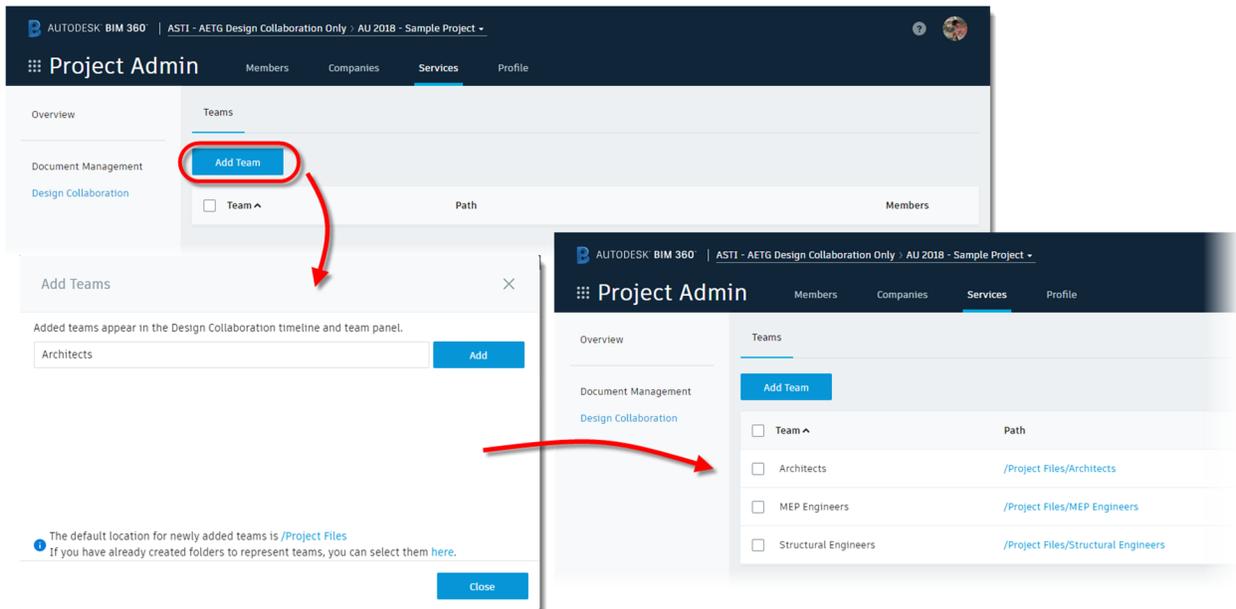
Teams

Once you have added members to the project, you need to create Teams and add members to them. This is the part of Project Setup where you can automate the creation of team folders and permission levels, taking advantage of one of the critical differences between BIM 360 Design and BIM 360 Team.

1. On the Project Admin page, click the “Services” link, and click “Design Collaboration” from the list of available services on the left side of the window.



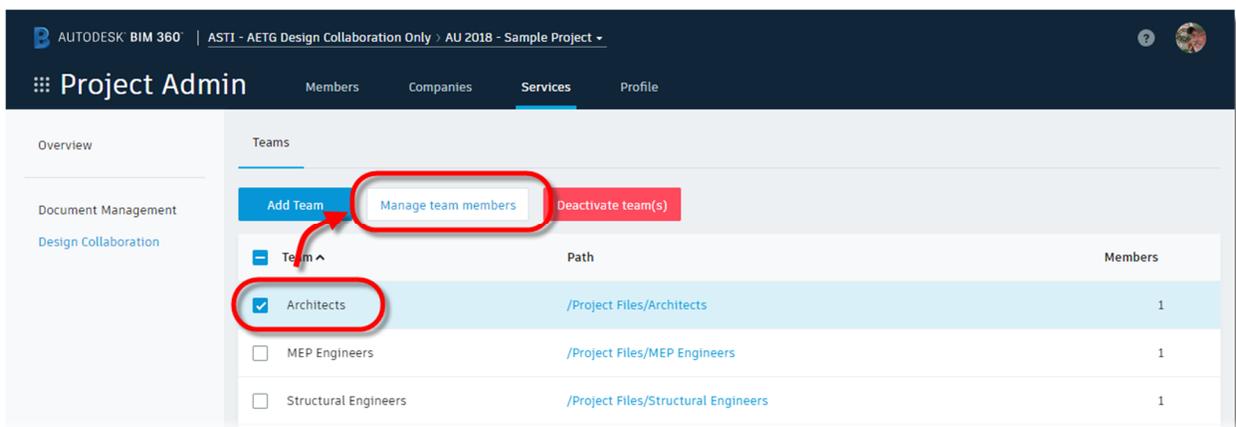
2. Click the “Add Team” button. In the “Add Teams” dialog, enter a team name and click “Add”. Continue adding teams, and when done, click “Close”.



Looking closely at the “Add Teams” dialog, note that you can specify your own folders for each team’s project files, however you can let BIM 360 Design create the folders for you, as shown in the “Project Admin” page on the “Services” link after you have created the teams, as shown in the image above. If you choose to use your own folder structure, you will need to carefully plan your permissions structure, and be ready to make adjustments. Allowing BIM 360 Design to create the team folder structure for you will, in large part, remove that task from your to-do list.

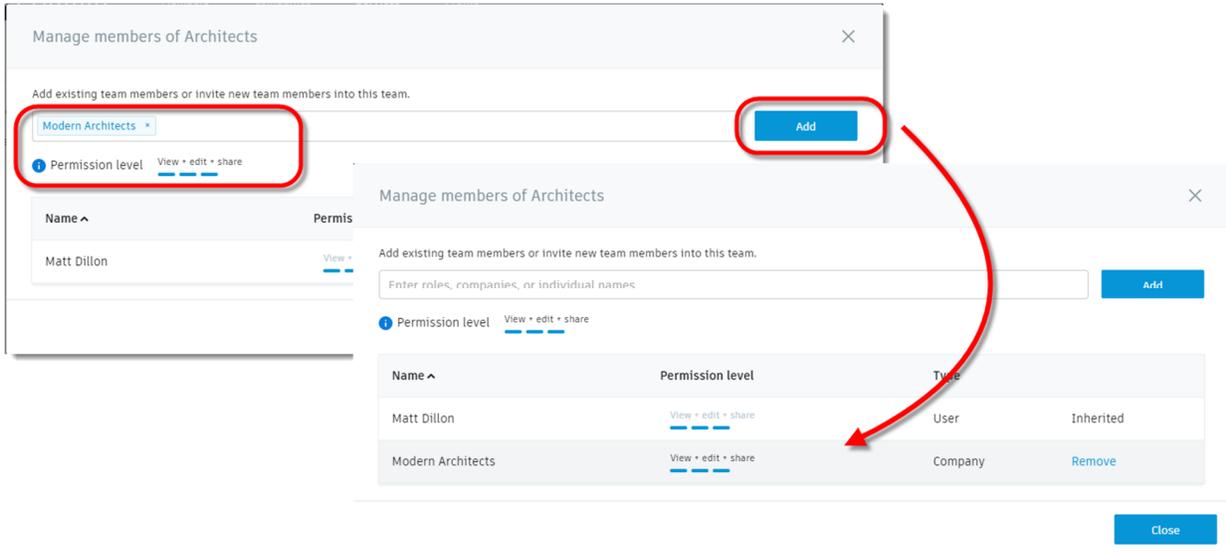
Next you need to specify the members of each team. You can use the companies or roles specified when you added the members to the project to streamline the process.

3. Select one of the teams, so that a check mark appears in the box to the left of the team name. Then select “Manage team members”, which will take you to a dialog allowing you to add and remove members as well as adjust their permission levels. The settings you establish here will control the access level that they have to the folders that correspond to the team.



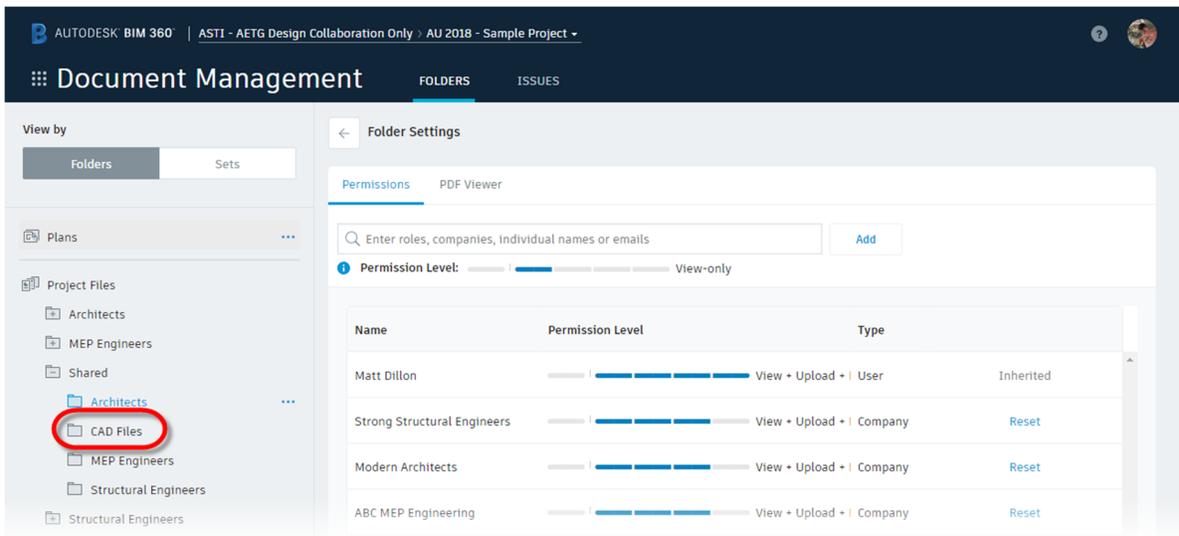
4. In the Team Management dialog, you can enter individual names, roles or companies. In the example in the following image, the company “Modern Architects”

has been added to the “Architects” team, and the permissions have been set to “View+Edit+Share” (the default is “View+Edit, however granting the “Share” permission allows a user to share data with other teams). In this example, everyone who is a member of “Modern Architects” has View+Edit+Share permissions in the “Architects” team’s folders.



Note: You can add users to multiple teams to give them permissions at varying levels in multiple team folders if you need to.

Once you have created the teams and populated them with members, you are ready to begin working in the project. As a final touch, you might consider going to the Document Management module and add additional folders for other, non-Revit files. In the example below the “CAD Files” folder has been added, with all teams having permissions to “View+Edit+Upload” files that might be linked into Revit projects.



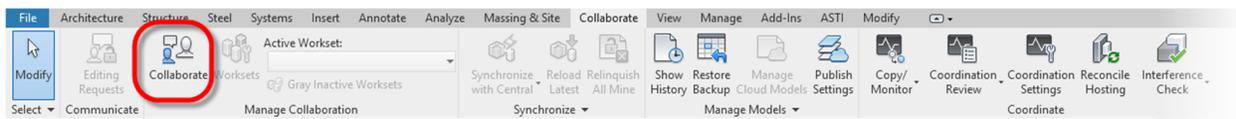
Revit Cloud Collaboration

As stated previously, the version of Revit that you are using will determine whether you can use BIM 360 Design or whether you will need to remain with BIM 360 Team. The steps to initiate cloud collaboration, however, are essentially the same, regardless of the Revit version.

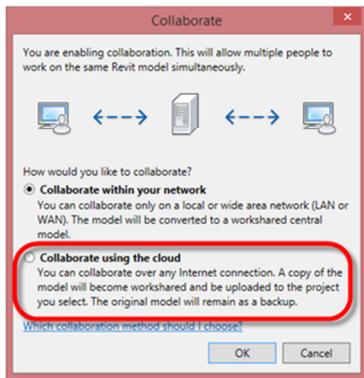
Initiating Cloud Collaboration

To initiate collaboration:

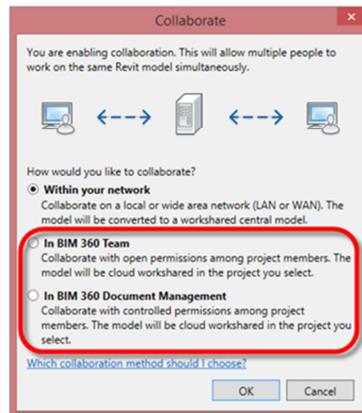
1. You must have first saved the Revit model that you wish to collaborate on in the cloud, and have that model open, and you must be logged into Revit using an Autodesk ID that has a BIM 360 Design entitlement assigned.
2. From the “Collaborate” ribbon tab, choose the “Collaborate” tool. The dialog that appears will look different, depending on which version of Revit you’re using – choose the appropriate option for collaborating in the cloud. In Revit 2018.3, you will have the option of using BIM 360 Team or “BIM 360 Document Management”, which is BIM 360 Design.



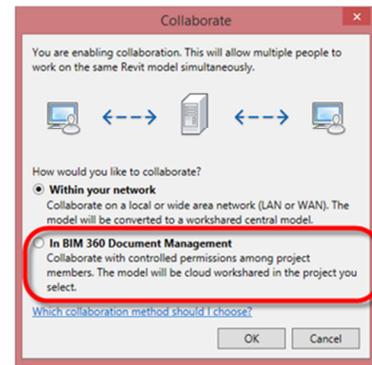
Revit 2018.2 and Prior



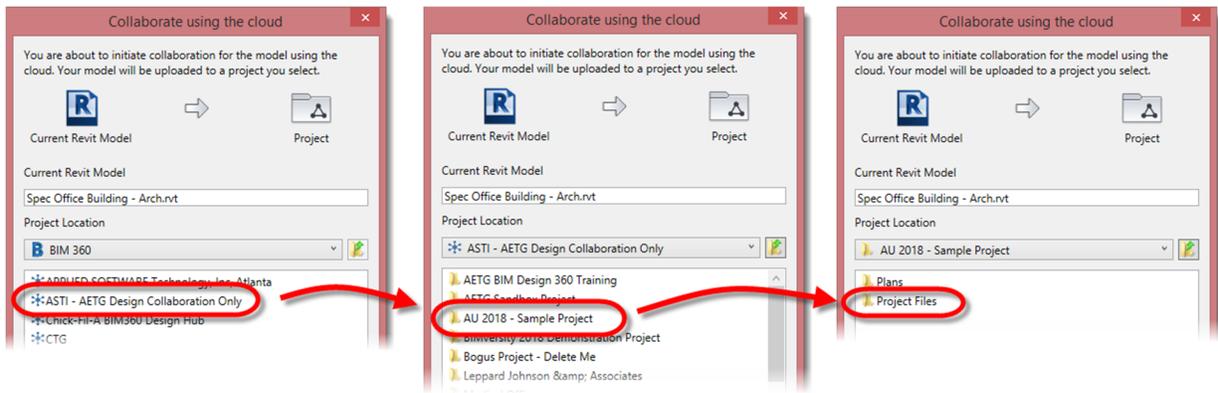
Revit 2018.3



Revit 2019

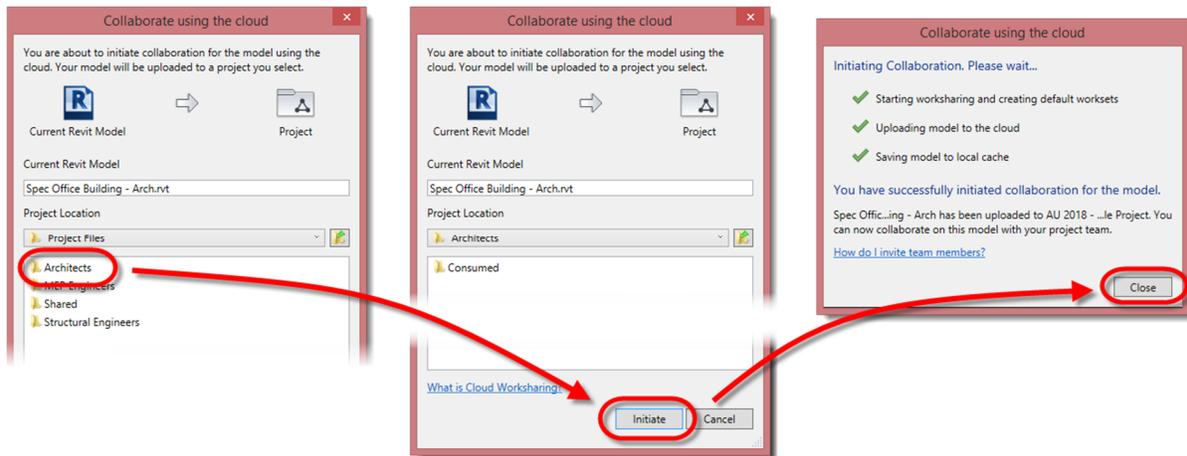


3. In the “Collaborate” dialog, you will see a list of all BIM 360 Design accounts that you are a member of. There may be only one here, or there may be several, depending on how many companies you are collaborating with and who is hosting the projects. Double-click the account (site) that you wish to initiate collaboration in, then double-click on the project that you want to collaborate in. If you see a “Plans” and “Project Files” folder, double click on “Project Files”. Never initiate collaboration in the “Plans” folder.



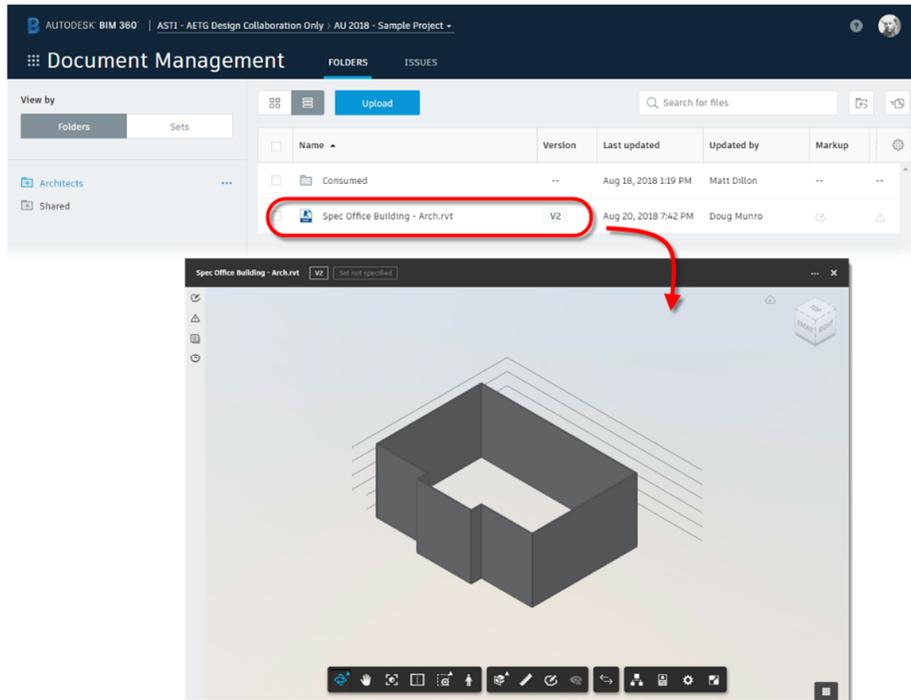
Note: The “Plans” folder is intended for a different purpose, and Revit projects uploaded to that folder will not act the same as Revit projects saved to the “Projects” folder, which is intended for use specifically with the Design Collaboration workflow. In many cases, you may not even see the “Plans” folder, as you may not have permissions to view it.

- Continue double-clicking until you are in your team’s folder. Do not double-click on the “Consumed” subfolder – that also has a different purpose, and different permission levels. In the image below, a member of the “Architects” team is initiating collaboration in the “Architects” folder.



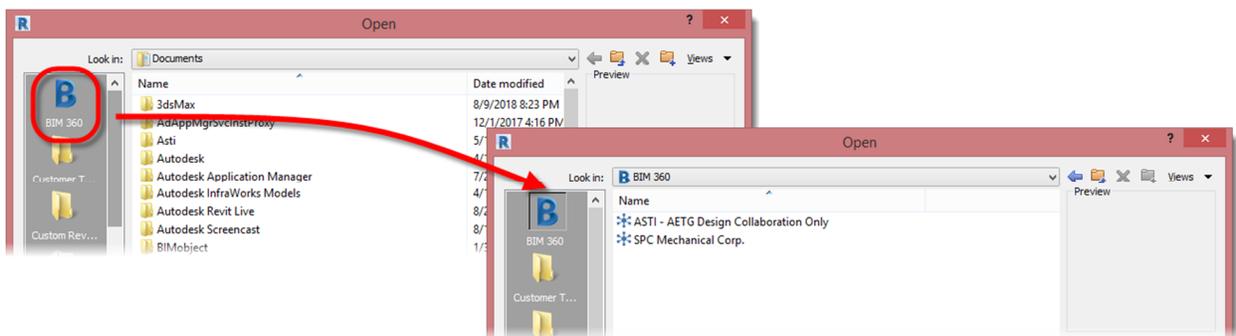
Once you have initiated collaboration, you can create worksets and begin working as you would normally work with a Revit workshared model, with the exception of the fact that you do not need to create a local file – the file you are in when you initiate collaboration becomes your local file – it is actually referred to as a “local cache file”.

After a few minutes of processing, the file you initiated will be visible in your browser and is available for viewing.



Opening a Cloud Model

To open a cloud model, select the “BIM 360” shortcut in the file “Open” dialog. You will be presented with a list of all sites that you have access to. Double-click the site that hosts the project you need to access, then double-click the project, and finally double-click on the folders until you get to the Revit cloud model that you need to open.



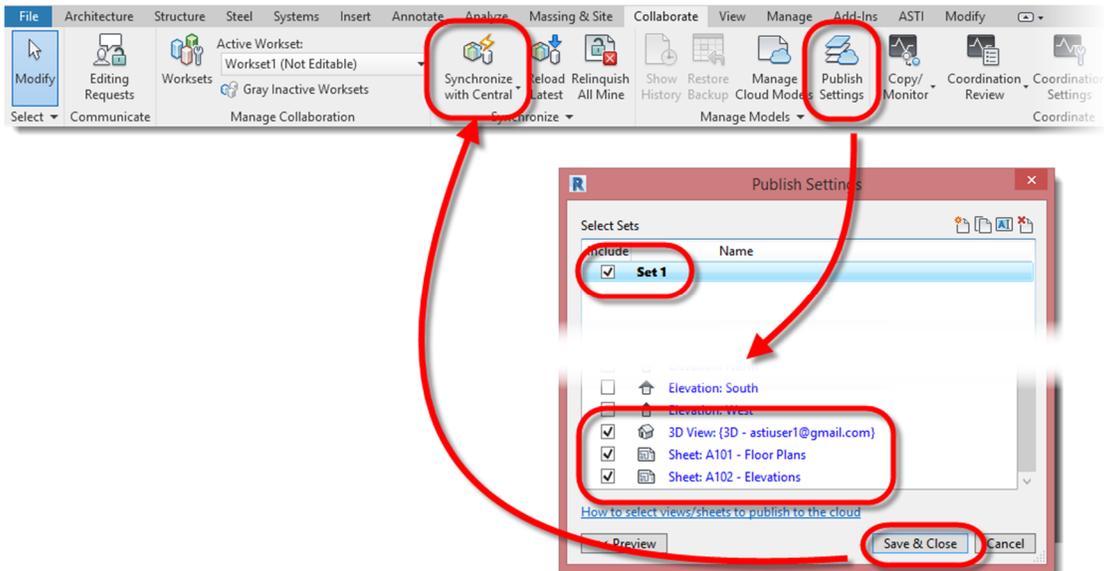
If you don't see the cloud model you need in the folder where it should be, go to the “Document Management” module of BIM 360 Design and determine if it is visible there. If it is, most likely you have “View” permissions, but not “Edit”. You must have “Edit” permissions to open a cloud model, or to even see it in the file “Open” dialog.

Publishing Revit Models

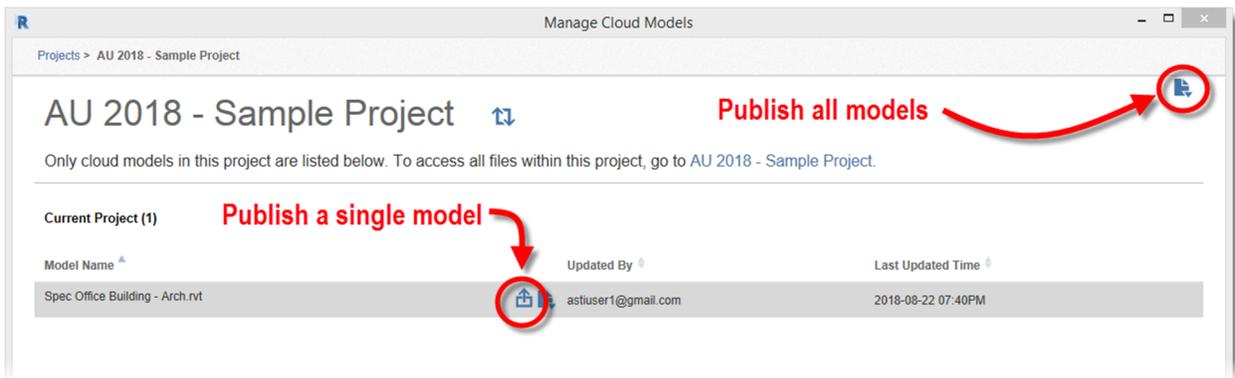
When working in a cloud model, you synchronize with the Central File and save locally just as you would with a normal workshared model. However, when you synchronize to a Central File hosted in the cloud, it does not update the visible model in BIM 360 Design. The live “synchronized” model that Revit users are working on is not exposed in BIM 360 Design. Publishing is also the first step in sharing data with other teams.

To publish a Revit cloud model and increment the version that is exposed in BIM 360 Design:

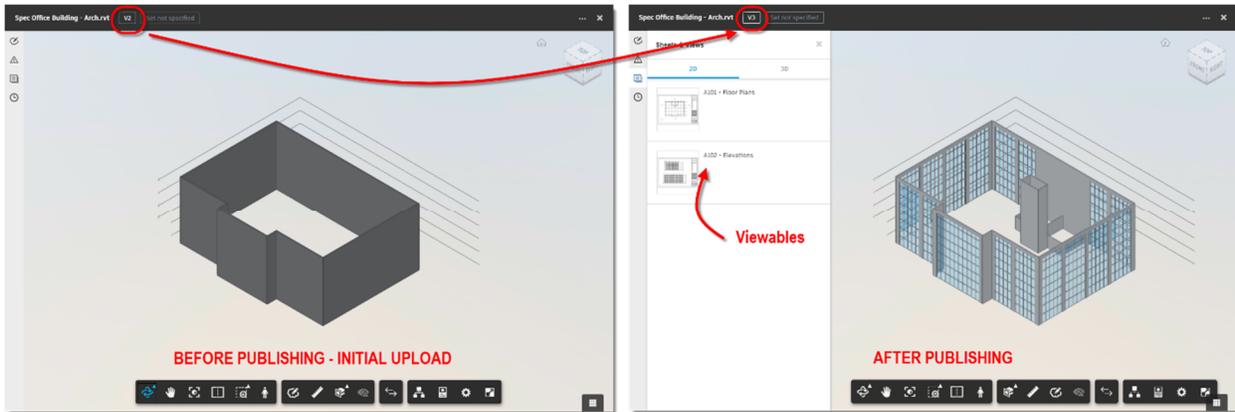
1. In Revit, from the “Collaborate” ribbon tab, choose the “Publish Settings” tool and specify the views and sheets that you want included in the “viewables” for the published version of the model.



2. Synchronize to the Central File.
3. From the “Collaborate” ribbon tab, choose “Manage Cloud Models”.
4. In the “Manage Cloud Models” dialog navigate to the project that contains the model(s) that you want to publish. Next to each model is a tool to publish that model, or you can choose the icon in the upper right corner to publish all models in the project to which you have access.



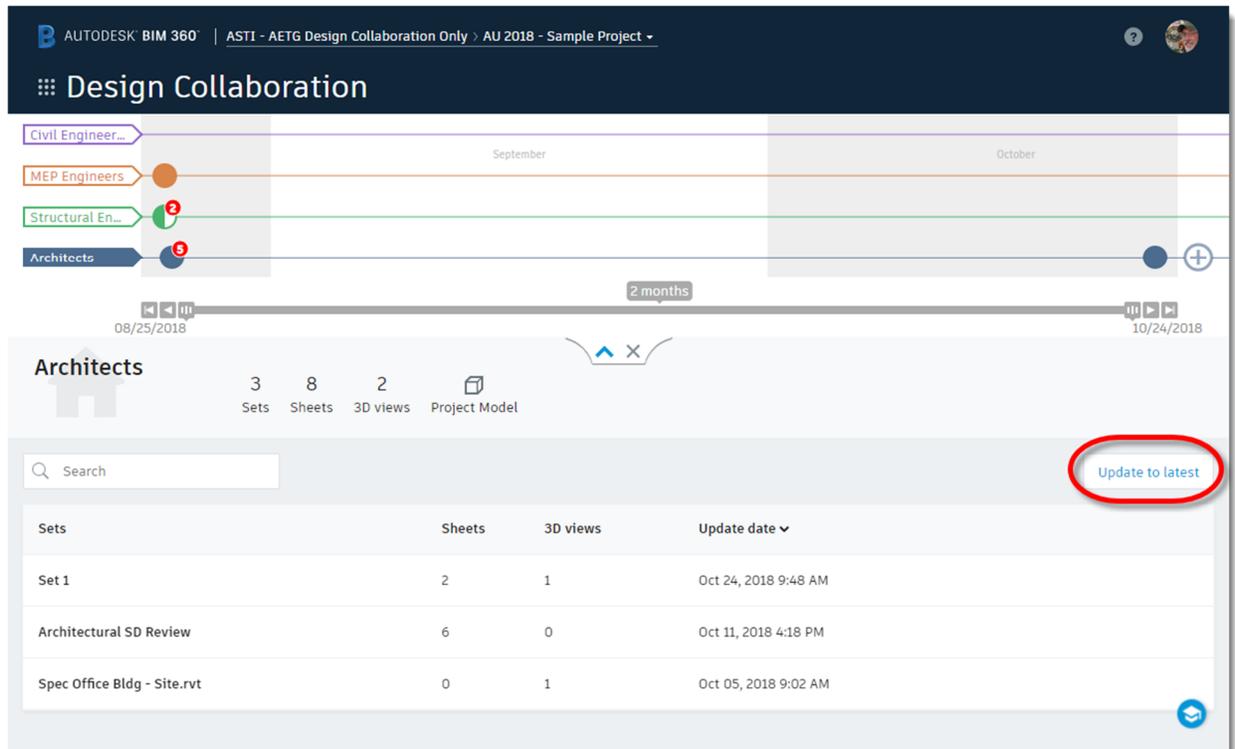
After publishing, BIM 360 Design will take a few minutes to process the model, after which the file version will be incremented and the viewables will be updated according to the views you specified in the publish settings.



Publishing is only the first step in sharing data. That version of the model will still not be visible to teams that do not have permissions in your team's folders.

Note: Consider publishing even when you are not yet ready to complete the process of sharing data. By publishing, you are creating a new version of your model in BIM 360 Team, which gives you additional backups to restore in the event of data loss or corruption. Previous versions can be restored to be the current version. If you never publish, however, you will not have any previous versions to restore.

There is an option to "Update to Latest" in the Design Collaboration environment, however when you use that to promote the latest synchronized version of the file to BIM 360 Design, it updates all sets in your team folder, not just one particular model.



Linking Cloud Models

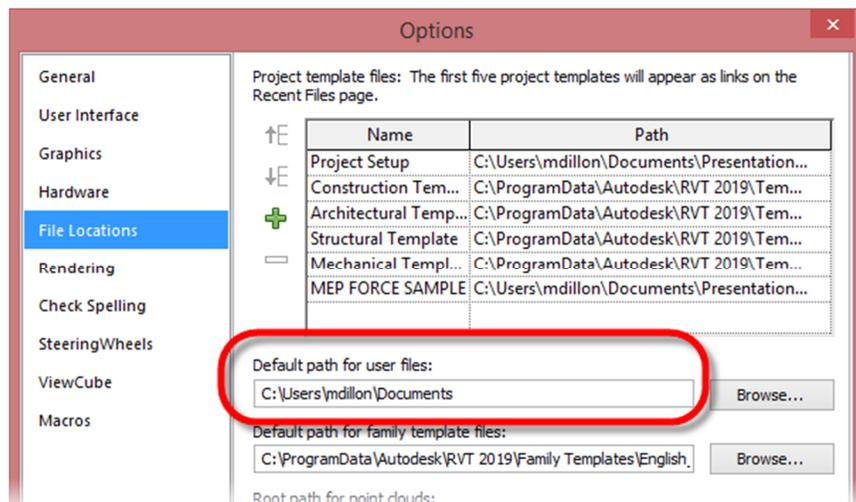
Revit cloud models are linked from the BIM 360 Design project. When the “Link Revit” tool is selected the “Import/Link RVT” dialog opens up at your current BIM 360 project automatically. The only files that will be visible initially are those that have had cloud collaboration initiated on them, and for which you have at least “View” permissions.

It is also possible to link Revit files and CAD files that have not had cloud collaboration initialized, but that were simply uploaded to the project using the BIM 360 Design web interface using the Desktop Connector. That workflow will be covered later in this document.

Local Cache Files

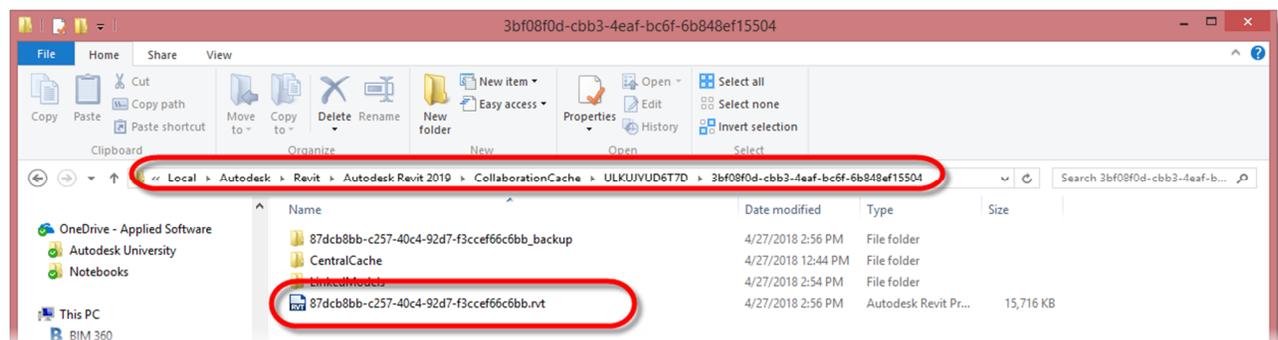
A significant difference between local worksharing and cloud worksharing is the way local data is handled and stored.

With local worksharing, the local file is stored where the “Default path for user files:” setting is pointing to – usually your “My Documents” folder. The files are easily recognizable as Revit files and projects are easily identified by file name. Additionally, each file has an associated backup folder



With traditional local worksharing, you can open the local file directly to work on it (although many offices have a standard of always creating a new local file when beginning a new editing session).

With cloud worksharing, the local data is stored in a local cache file, located in a subfolder of your “User” folder. The folder names and file names are encrypted, so while it is possible to identify a Revit file, it is impossible to tell which project it is by looking at the file name.



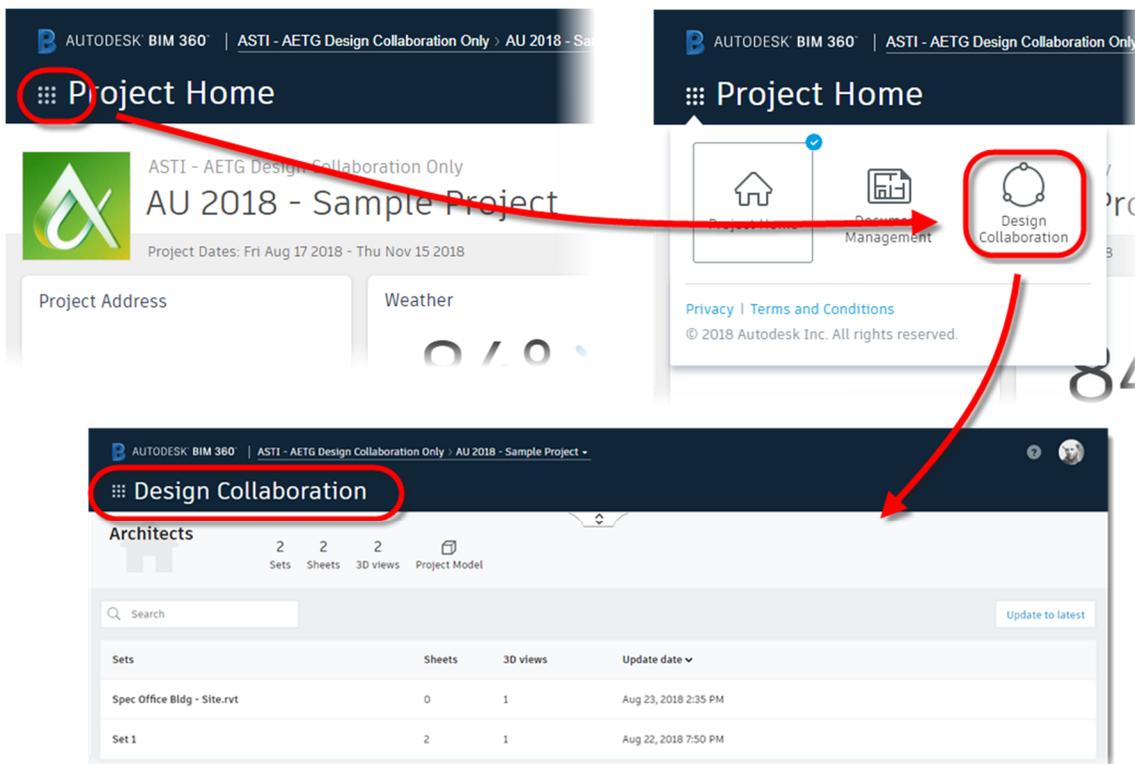
It is possible to open the file, and you might need to do that in the case of a catastrophic failure of the cloud model to see if you can find a local cache file that can be used as a new Central File, but you would only do so as a last resort. *Unlike with traditional worksharing, with cloud worksharing, you always begin a new editing session by opening the file from the cloud and allowing it to sync with your collaboration cache file or to create a new one.*

Design Collaboration Workflows

As stated earlier, one word that best sums up the difference between BIM 360 Team and BIM 360 Design is “control”. While it is possible to use BIM 360 Design almost exactly like BIM 360 Team, as a “high trust” environment, it is better to consider using the Design Collaboration module’s ability to control permissions and access through the use of teams. Each team can determine when their data is exposed to other teams for consumption, and each team can choose when to consume data that has been exposed.

The Design Collaboration Interface and Terminology

Access to the Design Collaboration interface is gained through the menu in the upper left corner of the BIM 360 project page. All the services you have access to, which depends on your role in the project, will be shown in the window that appears when selecting the menu grid. Choose the service that you want to use from the menu. Once you choose “Design Collaboration”, the overall interface will change to reflect that service.



The Design Collaboration service comes with its own terminology (refer to the image on the following page for an example of how the terms are represented in the Design Collaboration interface):

- **Swim Lane:** A display at the top of the Design Collaboration screen that shows the activity of all teams in the project, regarding the sharing of data. The swim lanes are activated by picking the double chevrons in the center top of the screen. Picking the

chevrons once will show two lanes – your team on one swim lane and all other teams on a single swim lane. Picking the chevrons again will show all teams that have shared data on their own swim lane. Picking the chevrons a third time will dismiss the swim lanes.

- **Set:** A group of views and sheets that have been published from Revit and can be or have been made part of a package. Sets can be created at any time, even prior to the initial model upload, and multiple sets can be created at one time, for different purposes.
- **Package:** One or more Sets and/or Revit cloud models that have been “packaged” and that are ready to be shared with other teams (or have already been shared). Packages that have been shared by other teams will show up on that team’s timeline as either a hollow circle or a filled circle. Hollow circles are packages that have not been consumed by your team and solid filled circles are packages that have been consumed by your team. Your own team’s packages will show as solid filled circles once your team shares them with the other teams and will be a hollow, dashed circle until they have been shared.

The screenshot displays the Autodesk BIM 360 Design Collaboration interface. At the top, a timeline shows swim lanes for Architects, Structural Engineers, and MEP Engineers. A package titled 'Structural 2018_0825_b' is highlighted, showing it was shared on 08/25/2018. The package content is shown as follows:

Package content			
1 Sets		1 Models	
Sets		Sheets	3D views
Set 1		1	1

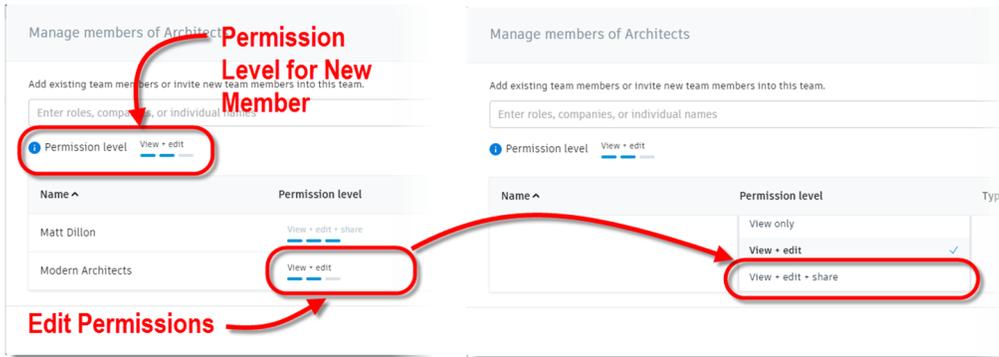
Red arrows point to various elements in the interface:

- Consumed Architectural Package (pointing to a solid blue circle on the Architects swim lane)
- Swim Lanes (pointing to the horizontal bars for Architects, Structural Engineers, and MEP Engineers)
- Create a New Package (pointing to a plus sign icon)
- New Package - Not Shared Yet (pointing to a hollow circle on the Structural Engineers swim lane)
- Unconsumed Structural Package (Selected) (pointing to a hollow circle on the Structural Engineers swim lane)
- Contents of Currently Selected Package (pointing to the package content table)

- **Share:** This action will expose a package created by your team to other teams and will be visible to them on your swim lane. They can then explore the package and/or consume it.
- **Consume:** This action will copy a team’s shared package to your team’s “Consumed” folder. You will have “View” permissions on the contents of the package.

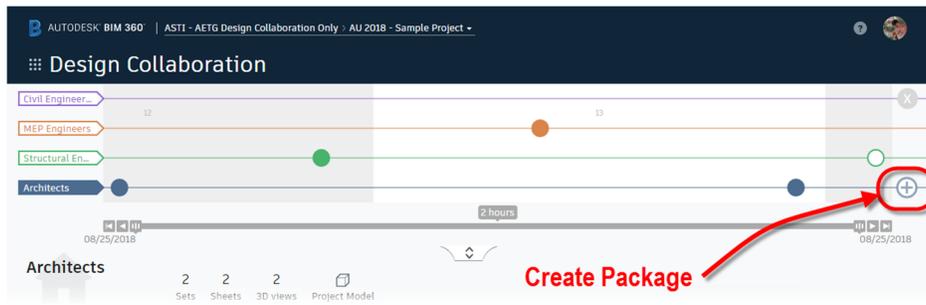
Sharing Data With Other Teams

Before any of the other teams can use your data, or even view the data, it must first be shared by a member of your team with the permission to share data. By default, when a project administrator adds members to teams, the permissions are “View+Edit”, meaning they can view their team data and can edit it, but they cannot share the data with other teams. The “Share” permission must be explicitly added.

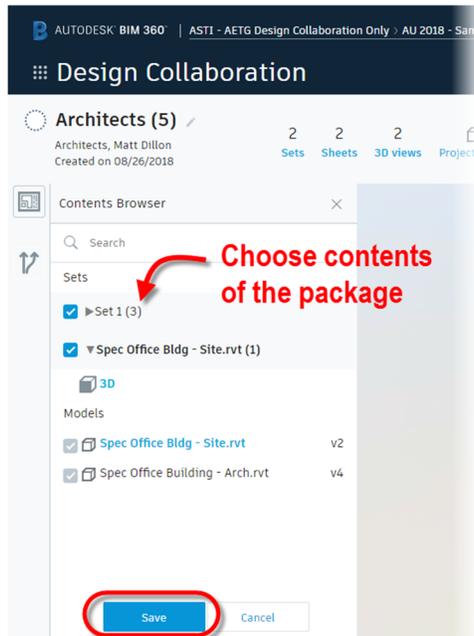


To share a Revit model with other teams, or update a Revit model previously shared:

1. Publish the model from Revit or “Update to Latest” in BIM 360 Design, which will increment the exposed model in BIM 360 Design to the next version.
2. On the Design Collaboration screen in BIM 360 Design, click the icon on your team’s swim lane to create a new package.

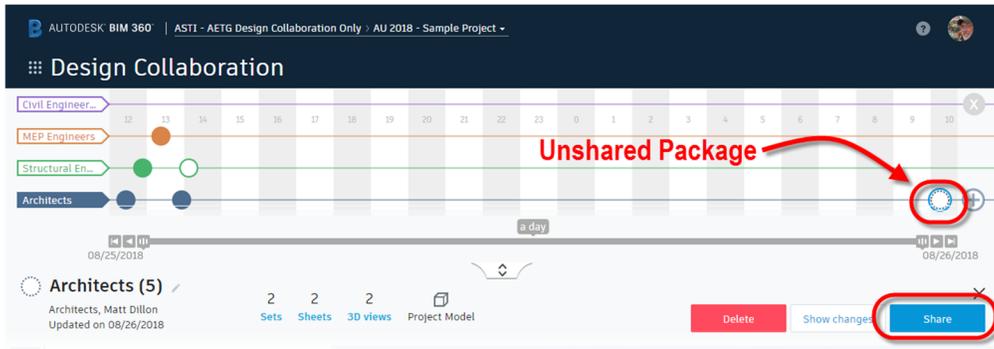


3. Select the Set or portions of a Set to include in the package and click “Save”.

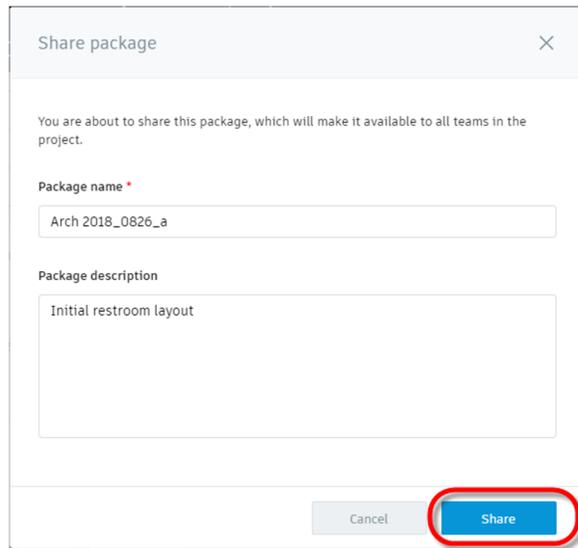


The package should now appear as an empty dashed circle on your team’s swim lane, indicating that it has not yet been shared – other teams will not see it yet.

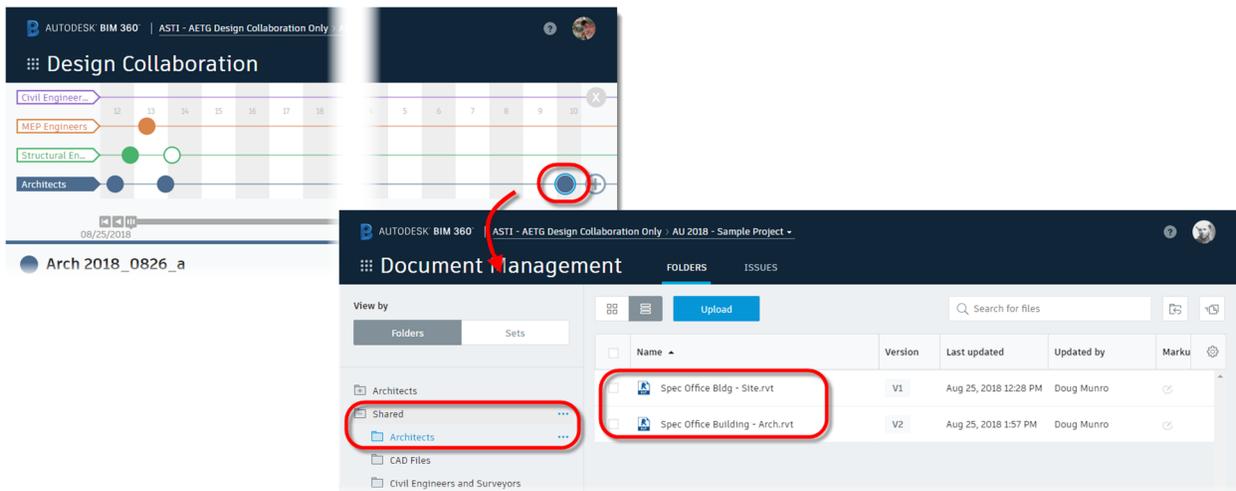
4. Click the “Share” button under the swim lanes.



5. Provide a name for the package and an optional description and click “Share” again.



The package will appear on your swim lane as a filled circle. Other teams will now be able to see it as well as consume it. In addition, the Revit model has been copied to your team’s folder under the “Shared” folder, visible in the Document Management screen. Other teams will have “View” access to this file without having to first consume it (more on this later).

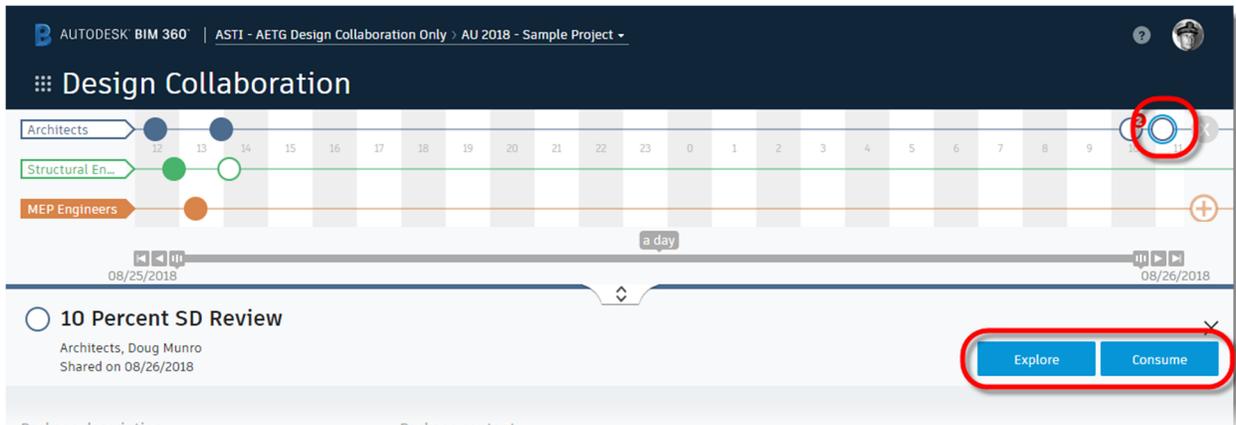


Consuming Data From Other Teams

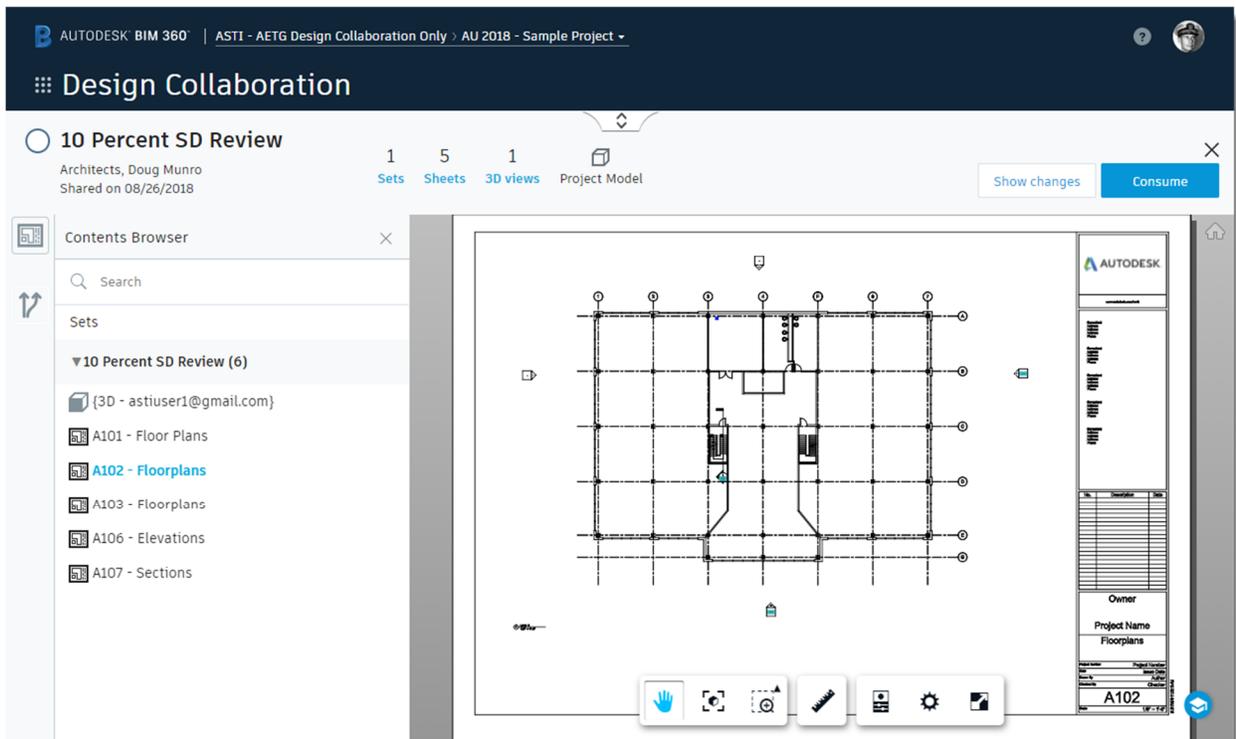
As stated previously, once a team has shared a package, it will appear on the swim lane for that team and can be consumed by the other teams. To consume a package:

1. On the Design Collaboration screen, select a package on another team's swim lane that has not already been consumed by your team. Unconsumed packages will appear as unfilled circles on the swim lane.

When you select a package, you can choose to consume it immediately, or you can choose to explore the contents first.



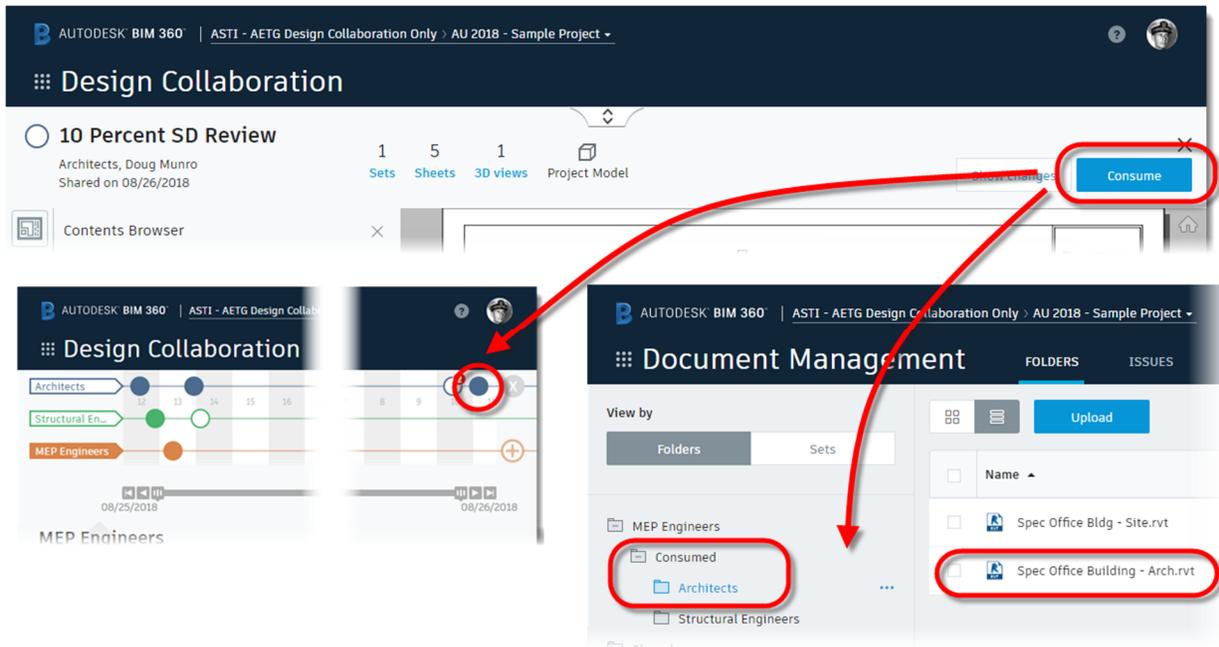
If you choose to explore the package, you will be able to view the contents and decide if it is a package that you are ready for.



Note: When exploring a package, you can also use the “Show Changes” button to compare it with previous versions to see the specific changes that were made from one version to the next.

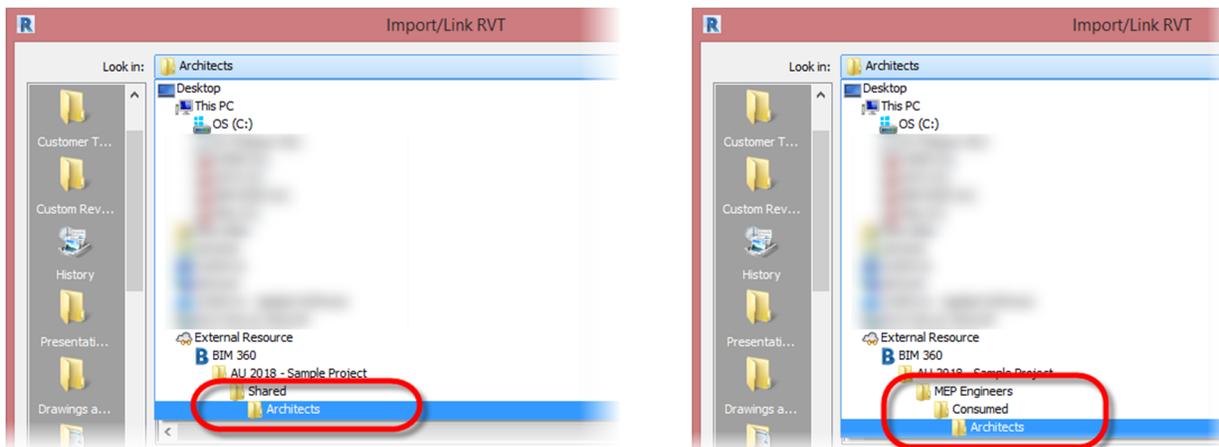
2. When you are ready to consume the package, choose the “Consume” button.

When you consume a package, the circle on the swim lane becomes filled, and the contents of the package are copied to your team’s “Consumed” folder. Everyone in your team will have “View” permissions on its contents. By default, other teams cannot see the contents of your “Consumed” folder.



Linking From the Shared Folder vs. the Consumed Folder

Why should you consume a package if it is automatically made available in the “Shared” folder as soon as a team shares it? Again, it comes down to *Control*. You can link a Revit file from either the “Shared” folder or your team’s “Consumed” folder, however what happens on subsequent updates will be affected by your choice.



- When you link from the “Shared” folder, when the source team shares subsequent packages, the contents of the “Shared” folder will be updated immediately, and the next time you open the project into which you linked the file, it will be updated as well. In other words, links from the “Shared” folder are updated automatically with no further action from you necessary.
- When you link from the “Consumed” folder, your links will only update when you consume subsequent packages, since the “Consumed” folder is only updated when you choose to consume data. You can explore a package, and then decide if you’re ready for that update or not. If not, then you can choose not to consume yet.

*Linking from the “Consumed” folder, then, provides you more control, however it also puts more responsibility on your team to regularly check the swim lanes for updated packages. Otherwise, your data will never update and your model will become out of date. **TIP:** You can subscribe to folders in the Document Management service by selecting the folder and right-clicking on it. Subscribing will cause you to get email notifications whenever anything is modified, added or deleted in that folder. If you subscribe to a team folder under the “Shared” folder then, you will get notified when they publish a new package, because their model in that folder will be updated. You can then go to BIM 360 Design and explore the package to see if you need to consume it.*

Using Data From Non-Cloud Sources

In order for Revit models to be linked using the Design Collaboration workflow, they must be Revit cloud models, just like your host model – in other words, collaboration has to have been initiated on them as well. What about consultants who are working on your project who are, for whatever reason, not a part of your BIM 360 Design project, or who are simply providing you with AutoCAD files? That is what the Desktop Connector is for.

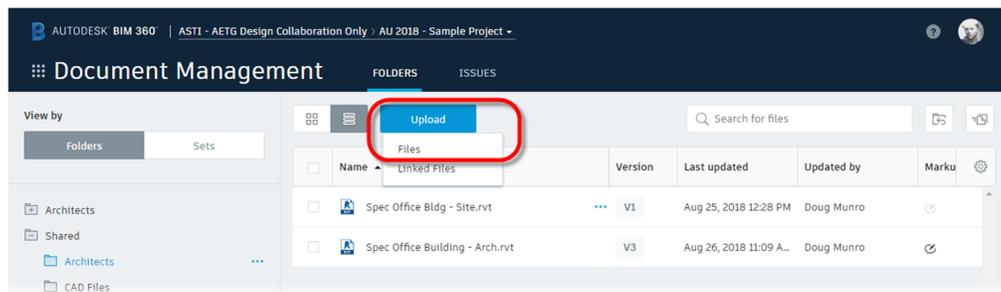
Desktop Connector functions much the same way Dropbox and other cloud-based file hosting systems work. Files that are stored in your BIM 360 Design project will be visible in Windows Explorer in a BIM 360 “drive”. By using this drive to link your CAD files and non-cloud-collaborated Revit models, you establish the path for the link as being in the cloud, and other project members will be able to reference the link from the same cloud path.

As with all other files, you must have “View+Edit” or “View+Upload” permissions to upload a file to a folder. Anyone linking the file must have “View” permissions at least.

Linking CAD Files with the Desktop Connector

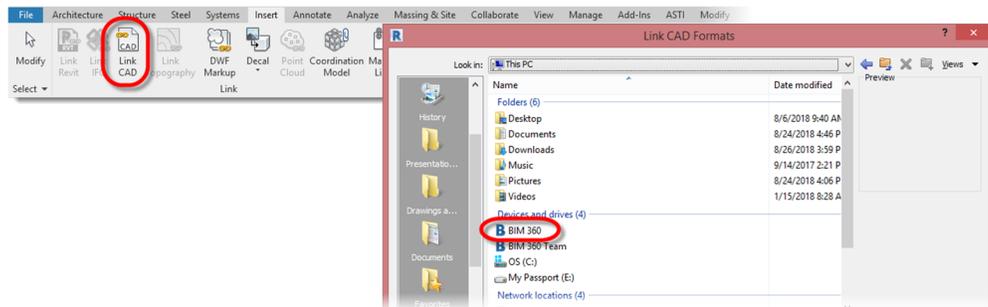
To link a CAD file into a Revit project:

1. Navigate to a suitable folder and click the “Upload” button, then choose “Files”. Find the file(s) you want and click “Open”.

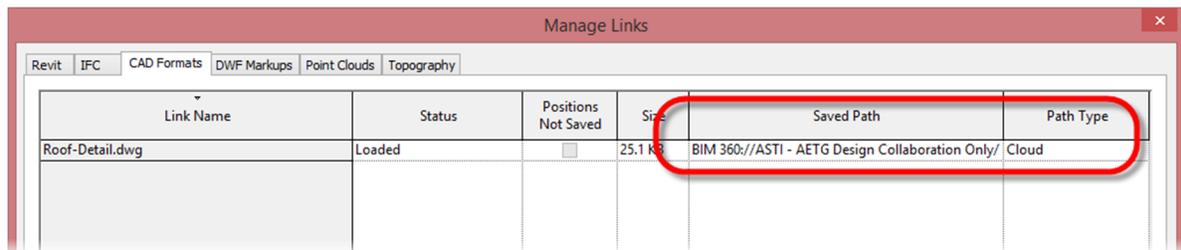


Note: The “Linked Files” option can be used to upload a Revit host model and its links, maintaining the relationship between host and links.

2. Click “Link CAD” from the “Insert” ribbon tab in Revit. In the “Link CAD Formats” dialog, navigate to the “BIM 360” drive, then navigate to the project and folder the CAD file is in, then click “Open”.



Checking the CAD link’s path in the “Manage Links” dialog will show it as a cloud path, referencing the project and project folders, which is the same location other users will “see”.



Any future edits to the CAD file should be done in AutoCAD using the Desktop Connector to navigate to the cloud file as well. In this way, the cloud-hosted file’s versions will be incremented properly when it is saved, and the link in the Revit model will update accordingly.

Linking Revit Models with the Desktop Connector

Linking non-cloud Revit models with the Desktop Connector is done in a similar fashion:

1. Navigate to a suitable folder and click the “Upload” button, then choose “Files”, or “Linked Files”, whichever is appropriate. Find the file(s) you want and click “Open”. If you choose “Linked Files” you’ll have a bit more work to do – you’ll need to specify the host model and the linked files before they can be processed.
2. Click “Link Revit” from the “Insert” ribbon tab in Revit. In the “Import/Link Revit” dialog, navigate to the “BIM 360” drive, then navigate to the project and folder the CAD file is in, then click “Open”.

Checking the link’s path in the “Manage Links” dialog will also show it as a “Cloud” path type. However, since it is not a truly cloud-collaboration model, but merely a cloud-hosted model, updating the link with changes is a bit more involved than with CAD files that can be edited in AutoCAD directly from BIM 360 Design.

If you need to update a cloud-hosted Revit model with changes that you have received from the author, you need upload the file to the same location as the original. BIM 360 Design will detect that it is a different version of the same file and will increment the version properly. However, in the Revit host model, you will need to use the “Reload From” tool in the “Manage Links” dialog to update the link. It will not update automatically.

Markups and Issues

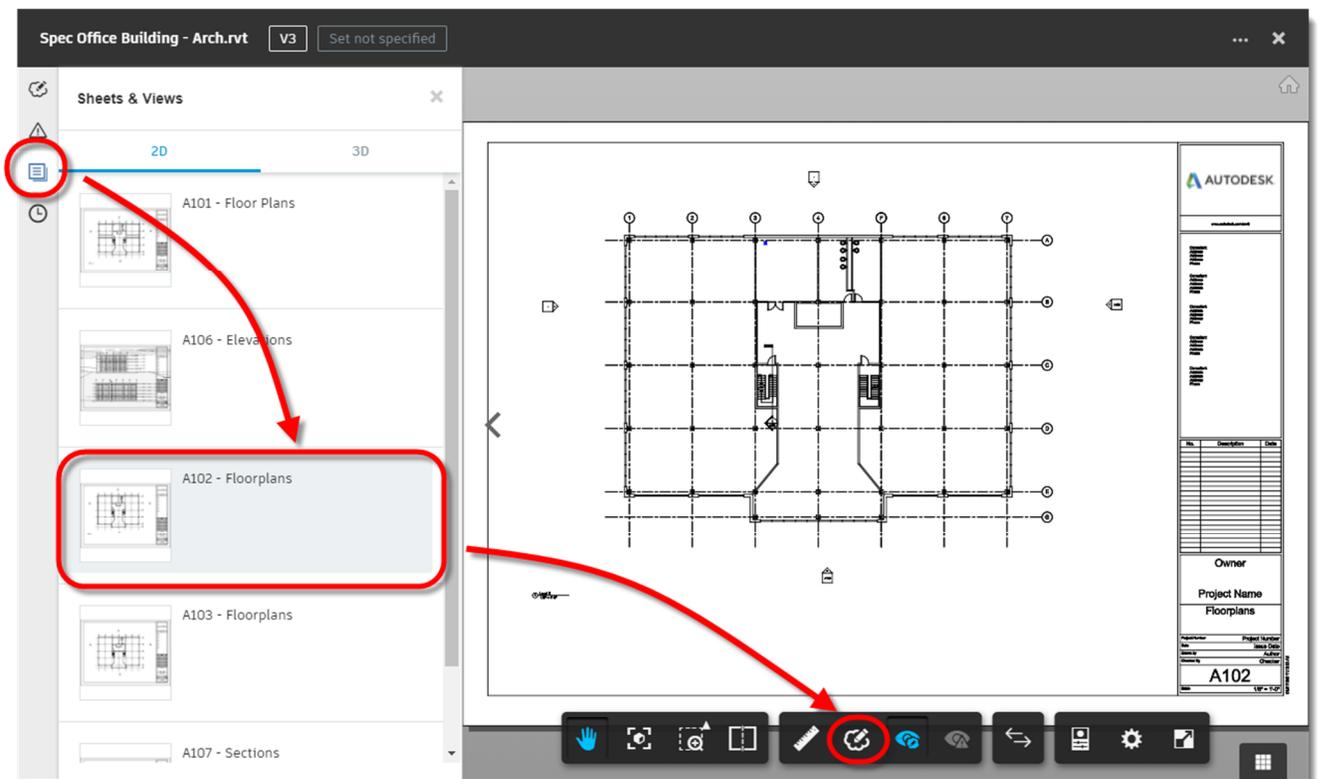
You can collaborate in BIM 360 Design outside of the Revit model as well, using markups and issues.

- **Markups** are marked up views that can be either public or private.
- **Issues** are locations identified that require some sort of action and are assigned to a specific person or group of people for action.

Whenever you are creating markups that you intend for others to see or issues that others need to act on, keep the permissions of the folders that they are located in mind. Other project members must have “View” permissions at least to see them. For this reason, if you work in the “Shared” folders, you will probably run into fewer access issues.

To create a markup:

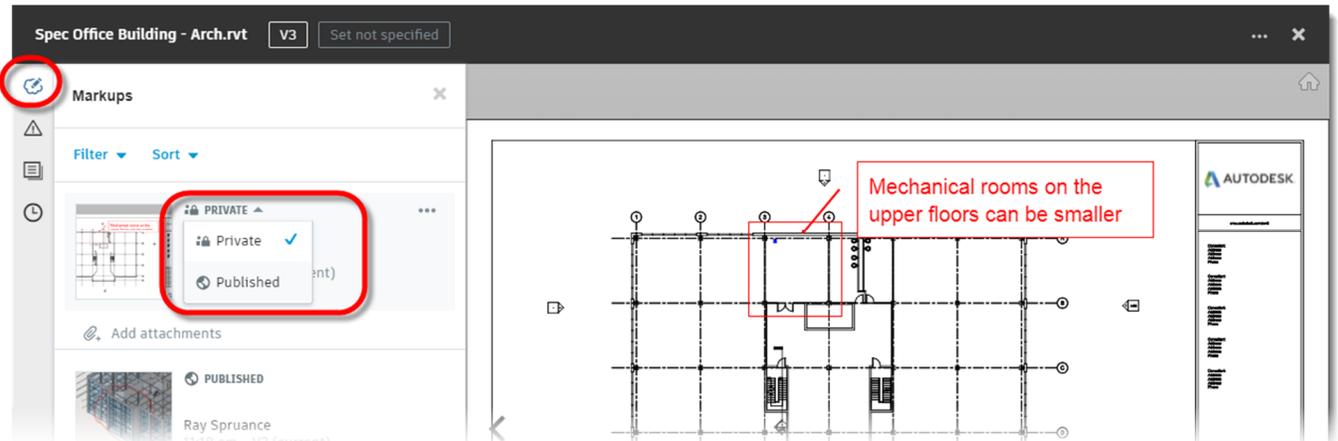
1. In the Document Management screen navigate to the folder containing the file you wish to mark up and click on the file.
2. Select the viewable that you want to mark up from the list on the left side of the screen.
3. From the toolbar at the bottom of the view screen, choose the “Create Markup” tool.



4. Use the markup tools that will appear on the toolbar to create the markup graphics.
5. Click “Done” on the toolbar.

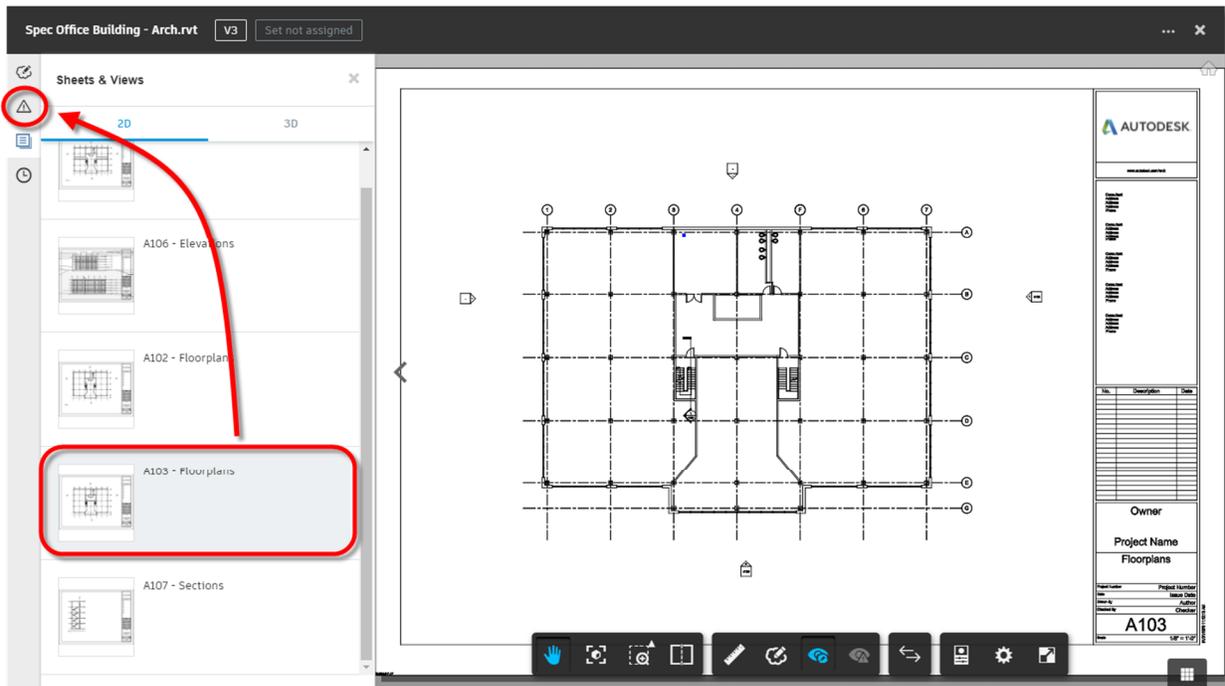
Your markup will be “Private” initially, meaning that you are the only person that will see it. To expose it to the rest of the project team (those that have permissions in the folder that the markup is in), you need to change it to “Public”.

6. Click the icon to view markups.
7. Change the markup to “Published” if desired.

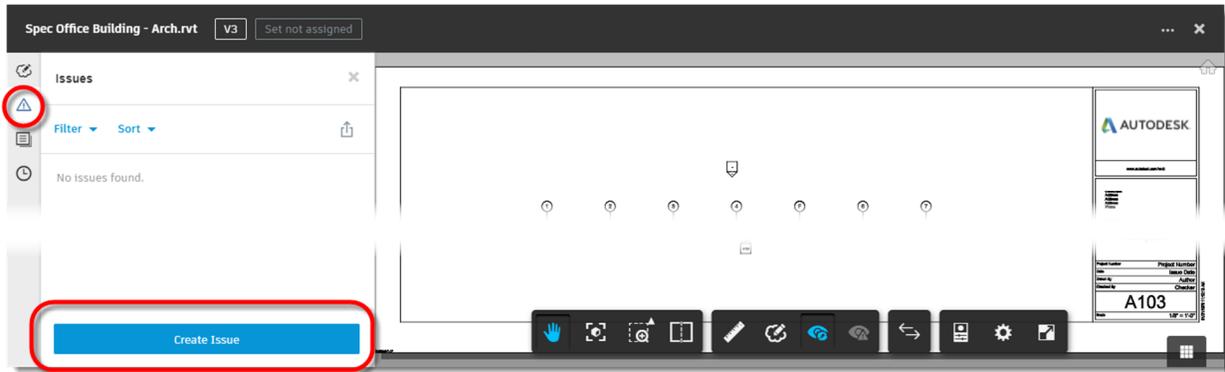


To create an issue and assign it to another project member or group:

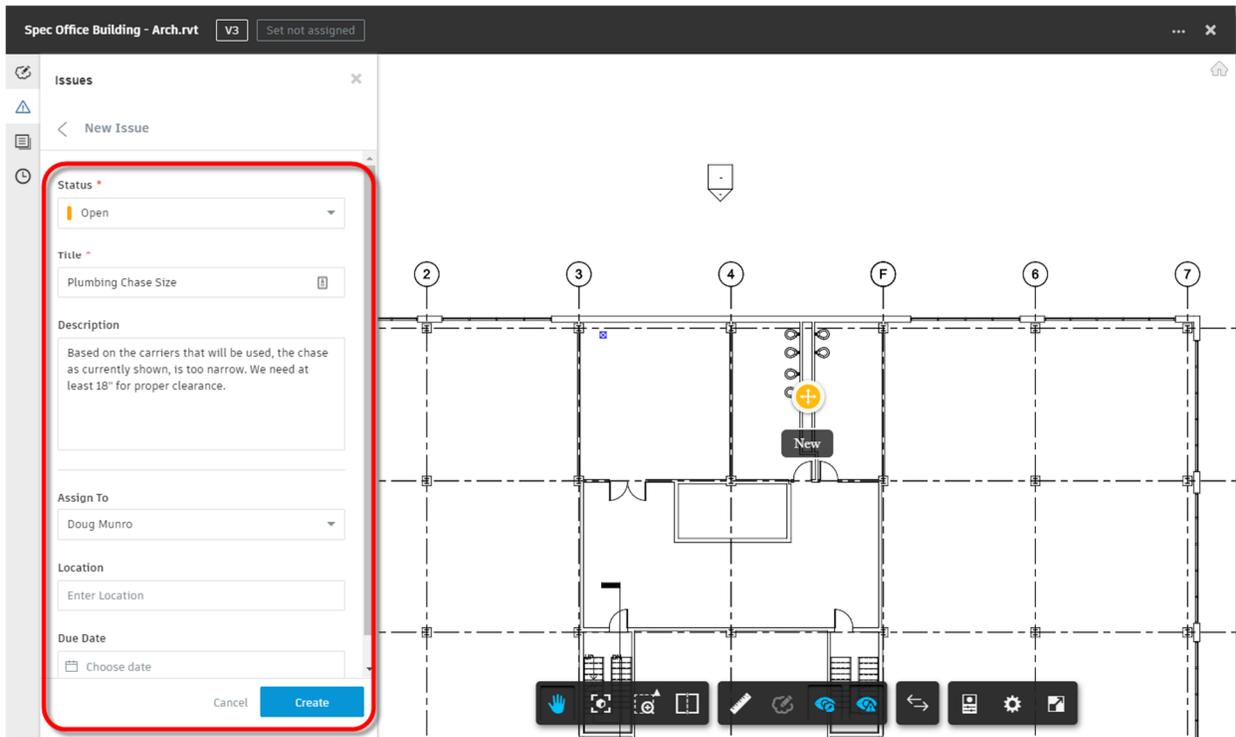
1. In the Document Management screen navigate to the folder containing the file you wish to create the issue for and click on the file.
2. Select the viewable for the issue from the list on the left side of the screen.
3. Click the “Issues” icon on the left side of the screen.



4. Click “Create Issue” at the bottom left of the next screen.



5. Pick a location in the view for the issue. A yellow target will be placed where you pick.
6. Fill in the details about the issue on the right side and assign it to either an individual, a company or a role. Optionally, you can also enter the location and a due date.
7. Click the “Create” button to finish creating the issue. Email notifications will be sent to those who the issue is assigned to and will include a link to the issue.



To respond to an issue, you can either follow the link in the email that you will receive, or you can log into your BIM 360 Design project and go to the “Project Home” page. Here, you will see a dashboard that will give you an overview of items in the project that may affect you, including new packages, existing packages and issues.

AUTODESK BIM 360 | ASTI - AETG Design Collaboration Only | AU 2018 - Sample Project

Project Home

ASTI - AETG Design Collaboration Only

AU 2018 - Sample Project

Project Dates: Fri Aug 17 2018 - Thu Nov 15 2018

Applied Software

Project Address

No location defined.
Please update in Project Administration.

Weather

81°

Partly Cloudy Day

Sat 89° Sun 84° Mon 80° Tue 85°

Powered by Dark Sky

My Document Issues

ID	Title	Due Date
3	Plumbing Chase Size	

Design Packages

Package Title	Date
<input type="radio"/> 10 Percent SD Review	Aug 26, 2018
<input type="radio"/> Arch 2018_0826_b	Aug 26, 2018
<input type="radio"/> Arch 2018_0826_a	Aug 26, 2018
<input type="radio"/> Structural 2018_0825_b	Aug 25, 2018
<input type="radio"/> Architecture 2018_0825_b	Aug 25, 2018

5 of 8 Packages | View all (8)

1. Click on an issue in the upper right section of the Project Home page.

In the "Issue" window, you can view the details of the issue (including clicking the link to the view where the issue was created), add, review and download documents, and track activity on the issue.

Issue #3 OPEN ▾

DETAILS ATTACHMENTS ACTIVITY

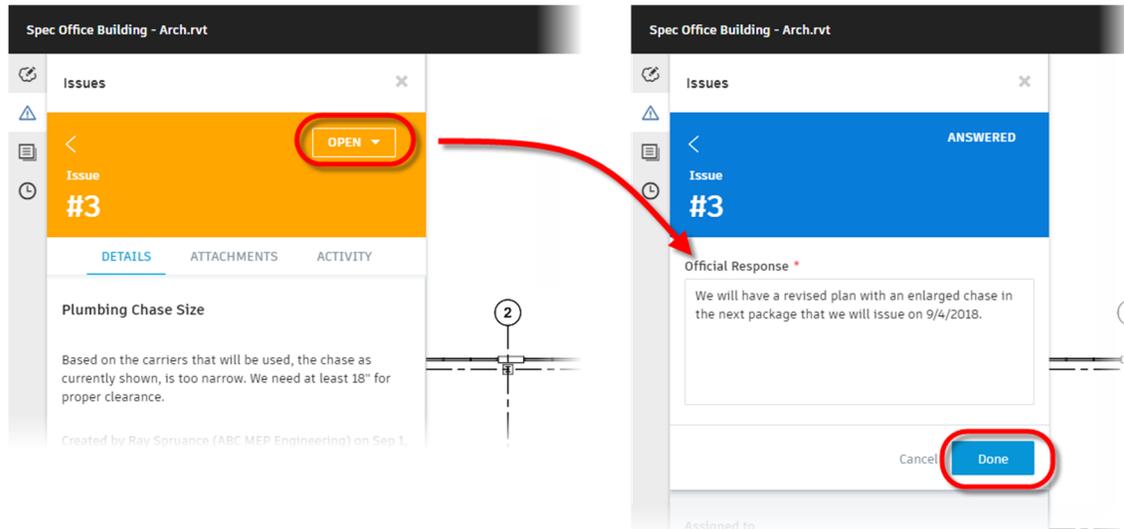
Plumbing Chase Size

Based on the carriers that will be used, the chase as currently shown, is too narrow. We need at least 18" for proper clearance.

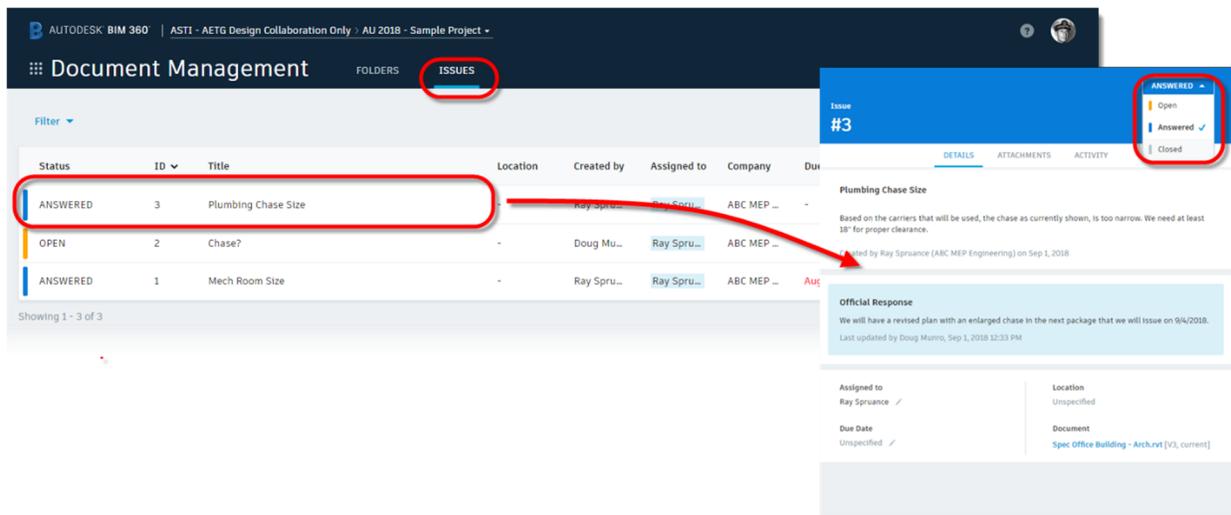
Created by Ray Spruance (ABC MEP Engineering) on Sep 1, 2018

<p>Assigned to Doug Munro </p> <p>Due Date Unspecified</p>	<p>Location Unspecified</p> <p>Document Spec Office Building - Arch.rvt [V3, current]</p>
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- To respond to or “Answer” the issue, click the link to the view, then click the “Open” status button in the upper right part of the screen. Change the status to “Answered” and enter a comment.



Another location to review issues can be found in the Document Management page by clicking on the “Issues” link at the top of the page. Here you can see the status of any issues assigned to you as well as those that you’ve created. If you have an issue that you created and that has been “Answered”, you can review the issue and if satisfied, you can close it. You can also reset the status back to “Open” for further action.



Troubleshooting Common Problems

Going back to the initial release of BIM 360 Team and A360 Collaboration for Revit in January 2015, BIM 360 Design can be considered a mature product over three years later. As a result, it is usually very stable. It is a web-based service, however, and there is always the risk of something going awry that is completely out of your control.

There are also some common user errors that can occur that are relatively easy to resolve:

- No access to BIM 360 Design from Revit:** This will manifest itself when you attempt to gain access to a cloud-based model to open it, or you try to initiate collaboration on a

Revit model. The file dialog box will display a message that you have no access to BIM 360. If it happens to you, do the following:

- Make sure you are logged into Revit with your Autodesk ID. BIM 360 Design is an entitlement that is assigned to specific users.



- Attempt to log into BIM 360 Design by going to b360.autodesk.com in your browser. Sign in with your Autodesk ID. If you have an entitlement, you will be taken to your default BIM 360 Design site. If not, you will receive an error and possibly a link to create an account. If you receive an error, have your organization's Contract Manager or Software Coordinator confirm that you have BIM 360 Design assigned to your user account and that the user ID matches what you are using to sign in with. If so, or if you DO get into the site through the browser, but not with Revit, there is most likely an issue with your account in Autodesk's database. You will need to contact your reseller or Autodesk to get it resolved.
- **You can get into BIM 360 Design from Revit, but you can't get to your project:**
There are a few things that can cause this. You may have not been invited to the project, or you may be using the wrong version of Revit. To troubleshoot, do the following:
 - Log into BIM 360 Design from your browser. If you can gain access to your project, then move to the next step. If not, most likely you have not yet been invited. Check with the project administrator and have them invite you.
 - If you can get into your project, then check the Revit version of the Revit cloud models in the project. You must be using the same version of Revit as that of the Revit models in the project, or you will not see it in the file dialog box in Revit.
 - If you can get into the project via your browser, and you have confirmed that you are using the correct version of Revit, then there is most likely a problem with your user account in Autodesk's database. You will need to contact your reseller or Autodesk to get it resolved.
- **You can get into your project in Revit, but you cannot get access to the Revit projects that you need to work on:**
 - Most likely this is a permissions issue. You need to have at least "View+Edit" permissions on the folder the project is in and on the project itself. You should get a project administrator to check your permissions in the BIM 360 Design project's folders. If you are allowing the BIM 360 Design Teams to assign permissions by default, and you are a member of the correct team, the chances of this happening to you will be reduced.

There are also times that, for no apparent reason, files that you have been working on are suddenly no longer accessible. If that happens, then you should check the status of the BIM 360 Design service itself. Navigate to health.autodesk.com in your web browser and check the status of "BIM 360 Design Collaboration". Note that you can also subscribe to email notifications for specific services when they are degraded, down or restored to service by clicking on the "Health Subscription" button in the upper right part of the screen.

Health Dashboard Sep 01, 2018 11:20:27AM PDT

View current status and upcoming maintenance schedule for the Autodesk Cloud Services

Health Subscription

Current Status History

Cloud Services	Status	Note	Upcoming Maintenance (PDT)
 A360	✓	Currently working as expected	No scheduled maintenance
 AutoCAD 360	✓	Currently working as expected.	No scheduled maintenance
 Autodesk Drive	✓	Currently working as expected.	No scheduled maintenance
 Autodesk Revit Live	✓	Currently working as expected.	No scheduled maintenance
 BIM 360 Account Administration	✓	Currently working as expected	No scheduled maintenance
 BIM 360 Account Administration (EMEA)	✓	Currently working as expected.	No scheduled maintenance
 BIM 360 Design Collaboration	✓	Currently working as expected	No scheduled maintenance
 BIM 360 Docs	✓	Currently working as expected.	No scheduled maintenance

Summary

BIM 360 Design is a much more mature product than the original BIM 360 Team that it will ultimately replace. BIM 360 Team is not “going away”, but as users continue to upgrade to more current versions of Revit and ultimately find themselves on Revit 2019 or later versions, BIM 360 Team will no longer be compatible with their Revit projects. By taking advantage of the BIM 360 Design Workflow, you can get more control over who sees your data and when, as well as what they can do with it. Conversely, you can also gain more control over the consumption of other users’ data by your own team; you can choose to wait until you’re ready for updates.

Using Issues, you can collaborate outside of Revit with other stakeholders, and there is a trail of activity that can be followed to review the history of file versions, issues and markups.

Finally, although it was not covered in this document, since BIM 360 Design is built on and includes the Document Management service, you can utilize its markup and collaboration features for reviews at critical milestones in the design process. Later, when the project moves into the pre-construction and construction phases, you can utilize its workflows that are more appropriate for those phases.