How to run Clash detection in BIM 360 Model Coordination using BIM 360 Design

Anil R. Mistry
Autodesk, Inc.

Scott Green
Autodesk, Inc.

Learning Objectives

- Learn how to share Revit model to BIM 360 Document Management using BIM 360 Design workflow.
- Learn how to prepare models for model coordination in BIM 360 Document Management
- Learn how to perform clash detections, review clashes, create issue, assign issue to team members in Model Coordination
- Provide useful tips and information for potential users and new users to set up and prepare to use BIM 360 Design, BIM 360 Document Management and Model Coordination space from the support perspective.

Description

Learn how to share models from Autodesk Revit to BIM 360 Document Management using BIM 360 Design and then use this model in Model Coordination for Clash Detection, reviewing clashes with team, creating issues and etc.

Model Coordination provides a shared space to publish, review and run clashes on your latest set of project models and upload 3D models to a centralized Model Coordination folder, and the clash service automatically locates any issues in those models.

BIM 360 Design is a cloud worksharing and design collaboration product built for distributed, multidisciplinary teams. With BIM 360 Design, you can co-author Revit models in the cloud, control worksharing activities, and coordinate deliverable exchange across teams.

AU Speaker(s):

Anil Mistry joined Autodesk as a Technical Support Specialist in February 2014. Currently I am working with the Autodesk BIM 360 (Field/Glue) support team and based out of Boston, MA office. I have been an Autodesk product user for more than 20 years.
I received my bachelor’s degree in Civil Engineering from University of Massachusetts, Lowell, MA. I have 15 plus years of experience working in Civil/Construction industry and worked on several small to large size projects. I was involved on many highway design projects (The Central Artery/Tunnel Project (BIG Dig), Manchester–Boston Regional Airport, NHFG, Broad Street Parkway, NH) for large and small clients including DOT and municipal clients.

I received a “Certificate of Excellence” for outstanding performance and excellence while providing oversight on New Hampshire Department of Transportation Federally Funded construction project.

Anil.Mistry@autodesk.com

Scott Green: I am a technical specialist on the BIM 360 support team in our Technical Support group at Autodesk. I work out of the Portland, Oregon office and I have been with Autodesk for five years. During that time, I have supported Revit, Plant 3D, AutoCAD, Navisworks, ReCap, and BIM 360. I am also a certified technical writer and I have hosted several AutoCAD and BIM 360 webinars.

Scott.Green@Autodesk.com
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What is BIM 360?

BIM 360 is a unified platform that connects your project data in real-time from design through construction, supporting informed decision-making and leading to more predictable and profitable outcomes.

BIM 360 improves construction project delivery by supporting informed decision-making throughout the project lifecycle. From design collaboration, documentation and reviews, to pre-construction, and through quality and safety and operations, BIM 360 connects the people, data and workflows on your project, so you can see the big picture and keep your projects on track.

The “Next-Generation” BIM 360 line of applications is a cloud-based series of applications built upon Autodesk Forge platform (Classic BIM 360 applications such as BIM 360 Glue and BIM 360 Field are not on Forge platform).

The Forge API:

Forge API is Autodesk’s cloud developer platform upon which the Next-Gen BIM 360 platform is based. Forge currently offers access to the following BIM 360 APIs (BIM 360 Account Admin, BIM 360 Document Management, Issues, and the Viewer) for customization/integration within other web and mobile applications.

BIM 360 Document Management:

BIM 360 Document Management (Docs) is a cloud-based file repository and collaboration environment that allows teams to manage blueprints, 2D plans, 3D models, and other project documents. This streamlines the document management process and connects to Autodesk’s other next generation SaaS products on the BIM 360 platform such as BIM 360 Model Coordination, BIM 360 Design (use with Revit), BIM 360 Build (aka Field Management), Design Collaboration (associated in with BIM 360 Design), Project Management, and Project Admin modules. BIM 360 Document Management serves of the focal point of the BIM 360 platform.

BIM 360 Model Coordination:

BIM 360 Model Coordination provides a collaborative environment to publish, review, and run clashes on 3D BIM models. When models are uploaded to a centralized folder within BIM 360 Document Management (Plan Folder), the clash service within Model Coordination will automatically locate any clashes within those models. The module allows for viewing model data and filtering that data to facilitate easier inspection of clashes.
Setting up a New Project and Activate Services (Account Administration)

The Account Admin module allows account administrators to manage the Autodesk BIM 360 account and its projects, members, and company data.

Account administrators can create projects, activate services, and assign project administrators to those services.

Creating a project:

1. In the BIM 360 Account Admin module, click the Projects tab.
2. Click Add.
3. In the Create Project Profile dialog, specify the project name and enter the project information. Required fields are marked with an asterisk. Some of the fields, such as the start and end dates, are used for company reporting and analytics to ensure all team members have access to consistent project information across workflows.
4. Select a language from the BIM 360 Field Project Language drop-down list.
5. Click Save & Continue to create the project and display the Activate Services page.
Activate Services and add Project Admin:

1. On the Activate Services page, click Activate next to each BIM 360 service you want to activate. The list of services depends on what modules you have purchased.

Note: For this class activate Document Management and Model Coordination services.
Important: After creating a project profile, you can activate BIM 360 services. 
Note: You must activate Document Management first, before you can activate other Next Gen services like Model Coordination, Project Management, Design Collaboration, etc.

2. When activating Document Management, you can choose to copy a folder structure from an existing project, to help organize your project documents. Select a project from the Copy Project Settings drop-down list. 

Note: When activating BIM 360 Glue or Field, you have the choice between the classic and Next Generation modules. See About Autodesk BIM 360 for more information. Once you start project in BIM 360 Glue Classics or Model Coordination you can’t switch back. If you want, you can create two projects and run parallel.

3. For each service you activate, add at least one project administrator. Enter their name or email address, and a company name. 

Note: Adding a project administrator is important, as they are able to activate further services for the project, assign a member’s role and company, and manage access and permissions.
New members added as project administrators receive an invitation to the account and the project. You can also add existing account members. Search the directory by entering a name or email, then click Save.

4. Click **Finish**.
Add Account Members:

Add individual members to the Member Directory or bulk-import multiple members using a spreadsheet. As a best practice, we recommend account administrators add their employees to the member directory first. Then, project administrators can use the search feature to more easily invite them to any project, without creating duplicate entries. While this practice is recommended, it is important to note that project administrators can add new members directly to a project, even if they are not in the account member directory yet. As soon as these new members are added to the project, they are added to the account member directory as well.

Add individual members to the directory

1. In the Account Admin module, click the Members tab.
2. Click Add ➤ Add people to the member directory.
3. Enter the person's email address, press the enter key, and click Add.
   
   **Tip:** If necessary, you can add multiple members at once before clicking Add.

4. Select the member's company and role from the lists and click Save.
   
   You can change the default company and role later if necessary.

Add multiple members to the directory

1. In Account Admin, click the Members tab.
2. Click Add ➤ Import members by spreadsheet.
3. Do one of the following:
   
   - For a first-time import, click Download the member list template and open it with Excel. In the template, replace the example entries with your actual member details, one member per row, and save the file. Then click Choose File to select the spreadsheet.
   
   - If you have a properly formatted member list spreadsheet, click Choose File and select the spreadsheet.

4. Click Start Import.
Manage Project Members and Access (Project Admin)

The Project Admin module allows project administrators to manage project members, companies, and services, as well as edit the project profile.

After an account administrator creates a project, they can add one or more project administrators to handle the administrative responsibilities for the project. Companies with multiple projects can delegate responsibility to project administrators to securely manage users and access on a project-by-project basis. Typical examples of construction industry positions that could fill the project administrator role include project managers or superintendents for a local project.

Within the Project Admin module, project administrators can add project members and control the member access to the various modules. They can also view all 3rd party companies associated with the project.

Administrator Permissions Reference:

<table>
<thead>
<tr>
<th>Task</th>
<th>Account administrator</th>
<th>Project administrator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Account setup</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Manage account administration rights</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Create or delete projects</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Activate modules &amp; add project administrators</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Manage account member directory</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Add companies</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Delete companies</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Manage project members</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Add Project Members:

1. Click **Module Selector ➤ Project Admin**.
2. Click the **Members** tab.
   - This opens the Project Members page, which displays all members of the selected project, their assigned role and company, and the services, or modules, that they have access to.
3. Click **Add**.
4. **To add new members:**
   a. Enter an email address and press **Enter** on your keyboard.
   b. Click **Select**.

**To add members who have already been added to the account:**
   a. Enter a name or email.
   b. Choose a member and click **Select**.

**Tip:** You can add one or more members to a project at the same time.

5. Optionally, assign the member to a company:
   - Search for a company that has already been **added to the directory by an account administrator**.
   - Add a new company. Type the name of the new company, then click **Create company <name>**.

   **Tip:** In Project Admin, click the Companies tab to view all 3rd party companies associated with the project, and the number of members associated with each company.

6. Optionally, assign the member a role(s).

   **Tip:** The **assigned role** determines a member’s access to all modules. For example, a Superintendent is granted administration rights and access to Document Management, Project Management, Model Coordination, Field Management, and Insight. However, this can be overwritten, as described in step 7 below.

7. To change the member's access level, click in the Project Admin or module columns:
The icon changes to indicate access level.

**Note:** Assigning access to individual modules overwrites the access level granted by role.

8. **Click Add to Project.** An email notification is sent, which allows the member to activate their membership and access the project.

Before you begin uploading models, the following must be setup.

Create structured project folders (Document Management):

Create a customized folder hierarchy for each of your projects.

Every project starts with pre-configured top-level folders to support a specific process or data type. These folders are called **Plans and Project Files**. You can add subfolders to these folders.

- **Plans**: Use the Plans folder to manage, download, review, and publish the latest set of construction documents, in both 2D and 3D formats. This is the digital equivalent to the printed set of contract drawings for the project.

- **Project Files**: Use the Project Files folder for any project document, including design data and all other document types. For example, photos, reports, schedules, budgets, requirements documents, etc.
**Note:** Folders can be manually created within Document Management or automatically within the Design Collaboration Project Admin area when creating Teams.

**Add Folders**

1. In the folder tree, right-click a folder ➤ **Add Subfolder**. A new folder appears below the parent folder.
2. Enter a name and press **Enter**.

**Assign Folder Permission**

1. In Document Management, select a folder and right-click ➤ **Permissions**.
2. For each member, move your cursor across the Permissions Level bar to select new permissions for a member, role or company. Permission levels include:

**Upload** - only. User/role/company may share their own documents in that folder with other team members.

**View** - only. User/role/company may view documents and add markups or issues, but cannot upload documents.
**View + Upload** - User/role/company may share and upload their own documents with team members and view any other documents in that folder.

**View + Upload + Edit** - User/role/company may share and upload their own documents with team members and view and edit any other documents in that folder.

**View + Upload + Edit + Control** - User/role/company may share and upload their own documents with team members and view and edit any other documents in that folder. As part of the Controller (control) role they can also carry out tasks within that folder that are usually restricted to the Project Admin. This includes creating title blocks, adding project members and managing permissions. This permission level offers the greatest access to folders.

**Upload Model**

1. In the Folder Tree, select a folder.
2. Click **Upload ➤ Files** and select a file. Alternatively, drag and drop a file onto the required folder.

**Note:** To select multiple files, press Shift+Click or Ctrl+Click.

3. Optionally, select **Add Files** and choose additional files for upload.
4. Select **Continue**.
Your files are then processed and published. A results dialog is displayed when completed.

5. Select **Show** to view the published files in your folder.

   **Tip:** When you open a document in the Plans folder, the set-specific information is displayed at the top left of the document, next to its name and version. Information about the set is not displayed in documents in the Project Files folder.

**Upload and Publish Linked Files**

Upload linked Revit files or AutoCad files that include xfefs. You must specify the parent or host file, which will be linked to the child file data.

**Note:** You cannot drag and drop linked files.

1. In the Folder Tree, select the folder you want to upload files to.
2. Click **Upload ➤ Linked Files** and either:
   - Select the parent (host) file.
   - Press **Shift+Click** or **Ctrl+Click** and select all files to be linked (parent and child).
3. In the Linked Files Upload dialog, select Add files and choose additional (child) files if necessary.
4. In the Parent File column, check the parent file ➤ **Continue**.

   Linked files are then processed and published. A results dialog is displayed when completed.

5. Select **Show** to view the published files in your folder.

**Create Teams (Document Management or Design Collaboration)**

1. Click on **Add Team from Project Admin ➤ Services ➤ Design Collaboration** to Create all the Teams that would be in the project (Architectural, Structural, Electrical, Plumbing, etc.)

   a. The first team added will result in a “Shared”, “Consumed”, and “Team Name” folder being created.
   b. “Consumed” folder will reside in the “Team Name” folder.
We see the two teams on the project timeline in Design Collaboration.

We also see new Shared and Consumed folders for the two teams in Document Management.
2. Add members to Team through Design Collaboration or within Document Management.

   a. Permissions/visibility into Team folders can be done either within Document Management or the Design Collaboration Project Admin area

Add Team members and set permission through Design Collaboration

1. Click on Project Admin from module selector
2. Click on Services tab
3. Select Design Collaboration from left navigation menu
4. Select Team
5. Click Manage team members
6. Enter roles, companies, or individual names
7. Select Name
8. Click Add
9. Set Permission Level
Assign Folder Permission (Document Management)

1. In Document Management, select a folder and right-click > Permissions.
2. For each member, move your cursor across the Permission Level bar to select new permissions for a member, role or company.
   Permission levels include:
   **Upload** - only. User/role/company may share their own documents in that folder with other team members.
   **View** - only. User/role/company may view documents and add markups or issues but cannot upload documents.
   **View + Upload** - User/role/company may share and upload their own documents with team members and view any other documents in that folder.
   **View + Upload + Edit** - User/role/company may share and upload their own documents with team members and view and edit any other documents in that folder.
   **View + Upload + Edit + Control** - User/role/company may share and upload their own documents with team members and view and edit any other documents in that folder. As part of the Controller (control) role they can also carry out tasks within that folder that are usually restricted to the Project Admin. This includes creating title blocks, adding project members and managing permissions. This permission level offers the greatest access to folders.

Initiating Design models (Revit 2018.3 or 2019 only)

1. Once Folders have been setup, members added to the project, and assigned to teams has been completed. Members should be ready to initiate models from within Revit.
2. Initiate the design models in your Team(s) folder within Project Files
3. **DO NOT USE THE PLANS FOLDER.** ALTHOUGH IT IS VISIBLE, INITIATING WILL BREAK THE WORKFLOW

Upload a Model to BIM 360 Document Management

As part of the process to set up Revit Cloud Worksharing, upload a model to BIM 360 Document Management.

1. In Revit, open or create a model.
2. Click Collaborate tab ➤ Manage Collaboration panel ➤ (Collaborate).

3. In the Collaborate dialog, select In BIM 360 Document Management.

4. Click OK.
5. If prompted, sign in with your Autodesk ID and password.
   
   Note: When you sign in, your Revit username changes to match your Autodesk ID.
6. Select the desired project folder.
7. In the dialog, click **Initiate**.

   Revit displays information about the status of the initiation process.

8. Click Close to continue.

9. If you subscribe to notifications in BIM 360 Document Management, you receive an email when your model is successfully published to the cloud.

10. If the uploaded model includes links, **migrate the linked models to** BIM 360 Document Management.

   **Note:** After a model has been workshared, the BIM 360 project is only visible to the release of Revit the model was shared from. Cloud models can only be linked to other models shared using the same release.
Migrate Linked Models to BIM 360 Document Management

Initiate cloud collaboration for each of the linked models, and then use the Manage Links tool to reload the links from their cloud location.

1. For each model that is linked to the host model, do the following in Revit:
   a. Open the linked model.
   b. Click **Collaborate tab ➤ Manage Collaboration panel ➤ 🔄 (Collaborate).**
   c. Select In BIM 360 Document Management.
   d. Select the BIM 360 project where the host model is stored and click OK.
   e. In the Collaborate dialog, click Initiate.
      Revit displays information about the status of the initiation process.
   f. Click **Close** to continue.
      Repeat this process for each linked model.

2. After you have initiated cloud collaboration from Revit on all linked models, open the host model in Revit.

3. Click **Manage tab ➤ Manage Project panel ➤ 🔄 (Manage Links).**

4. On the Revit tab of the Manage Links dialog, for each linked model, do the following:
   a. Select a linked model and click Reload From.
      Notice that the file browser opens by default to the BIM 360 project location.
   b. Select the name of the linked file and click Open.
      The cloud version of the link is cached on your local computer and loaded.

5. Repeat this process to reload each linked model from the cloud location.

6. Click **OK** to close the Manage Links dialog.

   **Note:** When a BIM 360 project is renamed, the Manage Links dialog may still reference the old project name in the link paths. The links will still resolve correctly, however the path may be confusing. To update the Saved Path to the new project name, use the Synchronize with Central tool, Synchronize and Modify Settings drop-down. Click OK. To update the link paths in the Manage Links dialog, click Reload.
Set up Model Coordination Folder in Document Management Plan Folder

Project Admins select a folder for coordination. The project team can then upload models to this folder.

1. Sign in to Model Coordination.
2. Follow the steps in the product to select a folder for coordination in the Document Management module. As a project admin, in the Plans folder section, you need to create a shared folder for coordination. It is recommended that you name this folder "Shared" so that team knows where the coordinated models are located.

   The selected folder and any subfolders are included for coordination.

Set up Model Coordination Space in Project Admin

Project Administrators set up the Coordination space for project. As a Project Admin, when you first sign in to Model Coordination, you'll be asked to select a folder in the Document Management module. This will become the Model Coordination space for your entire project team. This folder may contain subfolders, which are also included automatically.

1. Click on Create
2. Name your Coordination Space
3. Select Shared coordination folder
4. Click on Create to finish process
Upload Models for Coordination

1. On the Folders tab, select the **Model Coordination** folder.
2. Select **Upload** or **Upload ➤ Files** and select files. You can also drag and drop files into the folder.
   
   **Note:** At this time Model Coordination only support Revit and DWG files. Other file types are in feature road map.

3. Select **Continue**. The files are processed and then published.
4. Select **Show** to view the published files.
   
   All uploaded and processed models will appear under the ‘**Models**’ tab
View and Filter Models

When you add models to your coordination folder, clashes are detected automatically in Model Coordination.

1. In Model Coordination, select the **Models** tab.
2. You can see the coordinated model list, the contributor, and the total clashes for each model.
3. **Use Search** to narrow the model list. On the right you can filter by your models, or by the model contributor, company, or the date to narrow the list.

4. Select individual models and click **View** to see the aggregated set of models. In the example below, four models have been selected for viewing. **Select (○)** to control their visibility.
View and Filter Clashes

In the clash results grid, you can see each model and the number of clash groups for each individual pairing of models. Select a clash number to see that clash set in the 3D model.

1. In Model Coordination, select the **Clashes** tab.
2. Use the drop-down list to filter the models shown on the Clash grid or use the search to find a specific model or group.
3. Select a clash group to view the clashes in the coordinated models.
   In the grid the row header indicates the number of objects (within that Primary model) that clash with other models in the matrix. Each cell across the row shows how many of those [primary model] objects clash with the intersecting [secondary] model. Darker colored cells indicate where the most clashes exist.
4. As shown below, the selected clash group is highlighted in the model.

The ‘Red’ Element (Compound Ceiling) is the ‘source’ of the clashes, whereas the ‘Green’ Element (Rectangular column) is the element being clashed against.
Helpful Reference:

- Getting Started with BIM 360 Design
- To Manage Folder Permissions in BIM 360 Document Management
- Set up teams and folders comfortably with Design Collaboration’s Project Admin
- Understanding Revit Model Linking in BIM 360 Design
- BIM 360 Design is Released - The Next Generation of C4R
- Linking Cloud Workshared models in BIM 360 Design
- Creating and Consuming Packages
- To Work with Packages
- To Manage Teams and Team Members

Short YouTube Videos:

- Overview of BIM 360 Design
- Uploading Revit models
- Uploading Other Project Documents
- Creating and Consuming Packages
- New Videos for a BIM 360 Design Kickstart

Community Forum:

- BIM 360 Design Collaboration Forum
- BIM 360 Model Coordination Forum
- BIM 360 Document Management Forum

Online Learning Resources:

- Learn BIM 360
• BIM 360 Community Hub
• Connect and Construct
• ConTech Academy
• Construction Training
• Autodesk University – Class Recordings

Product Help Content:
• Account Administration
• Document Management
• Design Collaboration
• Model Coordination
• Autodesk Desktop Connector
• Desktop Connector for BIM 360