Erasmus+ Project ID: BIMVET3 2020-1-ES01-KA203-083262

This Erasmus+ Project has been funded with support from the European Commission. This publication reflects the views only of the authors, and the European Commission and Erasmus+ National Agencies cannot be held responsible for any use which may be made of the information contained therein

BLOCK X

Title: Autodesk Construction Cloud - BIM Collaborate Pro

1 – Aims

The purpose of this tutorial is to allow students to be acquainted with the tools and be able to understand and describe the essential workflow of Autodesk Construction Cloud and BIM Collaborate Pro.

Develop capabilities for:

- Create projects and manage permissions for their respective teams;
- Upload Revit templates and other files to the cloud;
- Manage cloud models;
- Share and review changes;
- Clash Detection;
- Issues management.

2 – Learning methodology

The teacher will give an explanation about the use of the tool.
Students will read this tutorial and watch the videos, and perform the steps shown in the videos, as well explore the tools of BIM Collaborate Pro.

3 – Tutorial duration

The practice described in this tutorial will last 3 teaching hours.

4- Necessary teaching recourses

Computer room with PCs with internet access.
Required software: BIM Collaborate Pro e Revit
Hardware required: Computer with the capacity to support the software.

5 – Contents & tutorial

5.1 Introduction
5.2 BIM Collaborate Pro (BIM 360 Design)
5.3 How to Start

6- Deliverables

To assess the achievement of the practice, students will write a report of 3 pages maximum.

In this report, the student will explain the steps taken in practice, the difficulties encountered, and the decisions taken. The report will be illustrated with photographs during the process in the platform.

7- What we have learned

The student has become acquainted with the concept of project collaboration and the essential workflow of Autodesk Construction Cloud and BIM Collaborate Pro, using tools to create and manage collaborative projects in the cloud from Revit templates.

8 – Files to Use

To follow the steps of the videos and explore the platform's tools better, use Revit files that were the result of the exercises done by the students previously in the tutorials of Block VII (*Tutorial VII.3 - BIM Architecture And Terrain Models With Revit and Tutorial VII.4 - BIM MEP Model With Revit. An Introduction).*

----------x----------

5 – Contents & tutorial

5.1 Introduction

Autodesk Construction Cloud is a cloud-based building collaboration and management solution that has unified previously existing BIM 360 and new offerings into a single brand.

In the Autodesk Construction Cloud platform, there are the following modules:

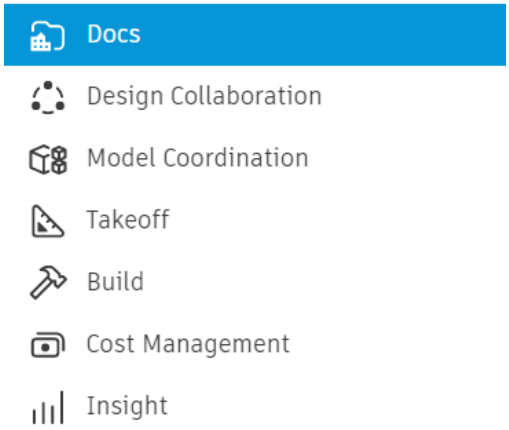


Figure 1: Autodesk Construction Cloud Modules

All these modules contribute to optimizing the workflow at the construction site, model coordination, project collaboration, cost calculation and document management. The tools were developed for the various phases of the construction life cycle and were also designed for the various actors involved in the work.

This tutorial will focus in particular on the modules Docs, Design Collaboration, Model Coordination, and with a brief presentation of the Insight module.

5.2 BIM Collaborate Pro (BIM 360 Design)

In 2021, BIM 360 Design was renamed and updated for BIM Collaborate Pro. BIM Collaborate Pro enables project collaboration and real-time data management in Revit, Civil 3D, and AutoCAD Plant 3D. You can work and access project data from anywhere and collaborate with internal teams or organizations throughout the project lifecycle.

BIM Collaborate Pro optimizes collaborative work with Autodesk's core design tools. For teams that create together projects, BIM Collaborate Pro (formerly Autodesk BIM 360 Design) project collaboration and collaboration software incorporates cloud collaboration capabilities for creating BIM models (includes Revit Cloud Worksharing, Collaboration for Civil 3D, and Collaboration for Plant 3D).

The development of architectural, engineering and construction projects is an iterative and complex process. BIM Collaborate Pro provides access control, tagging and revision features for construction and civil engineering workflows. Teams from different

disciplines can easily communicate status and share as project updates, as well as detect clashes and coordination issues.

BIM Collaborate Pro reduces work corrections, increases productivity and accelerates project delivery. The team manager gets better visibility and better manages the exchange of project data.

5.3 How to Start

To use BIM Collaborate Pro for free for 30 days, you must go to the link below and fill out the form on the Autodesk website:

https://projectdelivery.autodesk.com/bim-collaborate-pro-trial-eu/

After gaining access to BIM Collaborate Pro, you must follow the steps in the Autodesk Building Solutions videos shown in the next items.

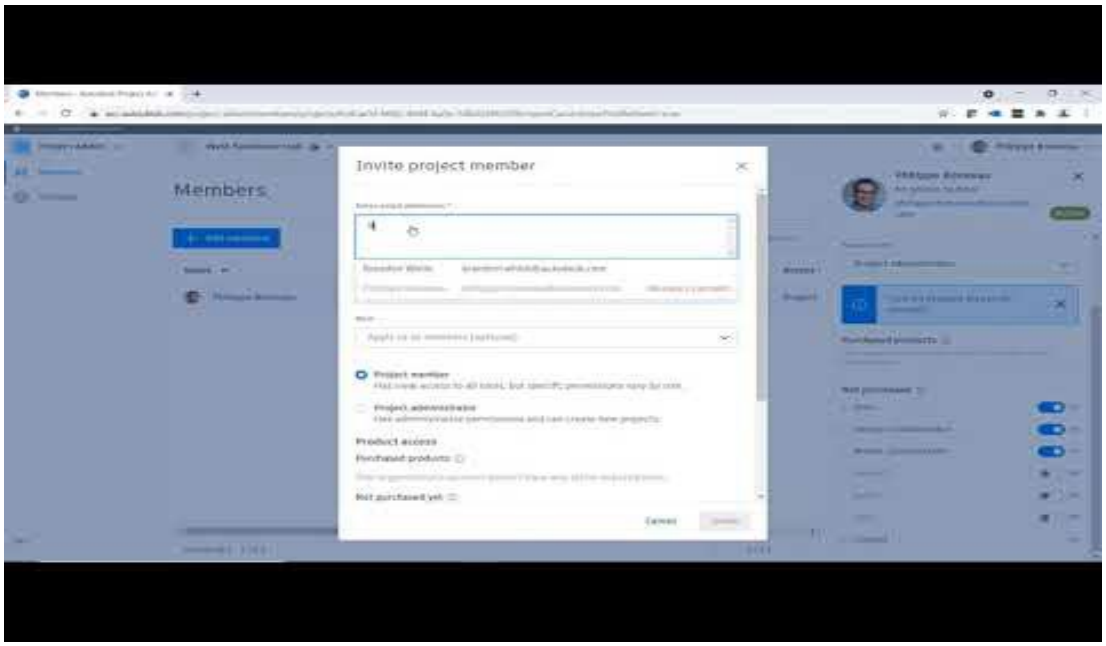
To follow the steps of the videos and explore the platform's tools better, it is suggested to use Revit files that were the result of the exercises done by the students previously in the tutorials of Block VII (*Tutorial VII.3 - BIM Architecture And Terrain Models With Revit and Tutorial VII.4 - BIM MEP Model With Revit. An Introduction).*

5.4 How to Work

5.4.1 Setting Up a Project

The first video shows an example of how to create and configure a project in BIM Collaborate Pro through the Autodesk Construction Cloud. This video also shows how to add members to the project.

https://www.youtube.com/watch?v=jnMOGLiJR80&list=PLY-ggSrSwbZqux3c7_GfNR5dgnTluBEYF&index=1



5.4.2 Working with Teams and Setting Permissions

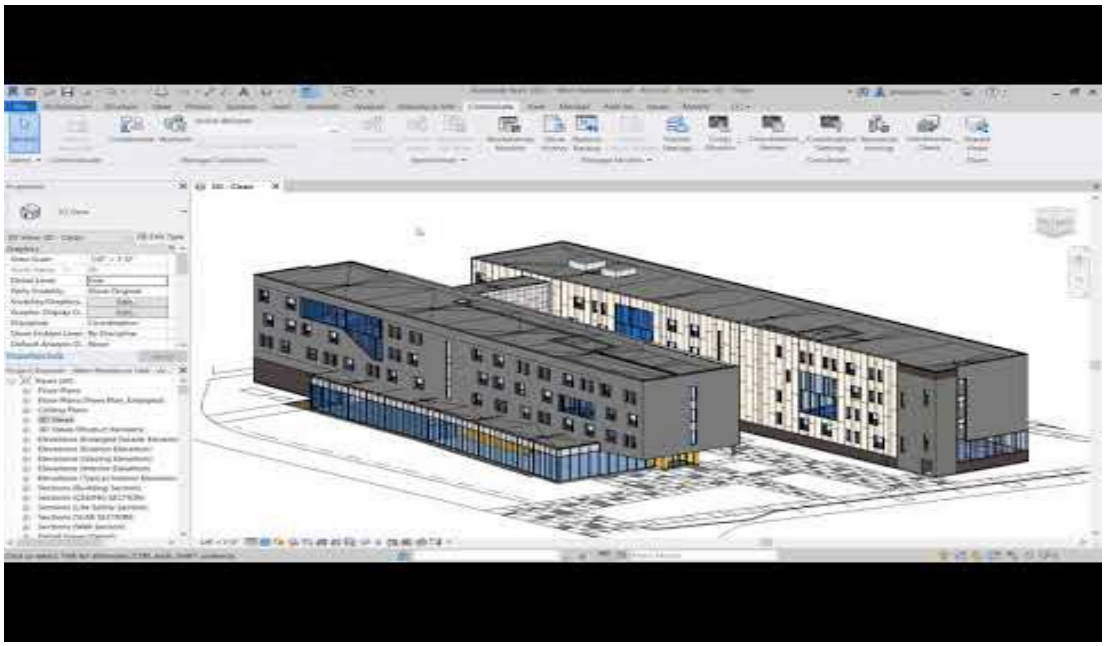
After organizing the structure of the project files, it is possible to create teams and assign members to them.

Teams represent specific companies or roles within a company. For example, teams can be divided by disciplines: Architecture and MEP.

It is possible assign each team a different set of permissions for the various project folders. It is also possible to assign unique permissions individually to each member to access files outside your team's folder.

The following video shows an example of how to create and configure teams and manage their permissions.

https://www.youtube.com/watch?v=_HezaD8lQfs&list=PLY-ggSrSwbZqux3c7_GfNR5dgnTluBEYF&index=2

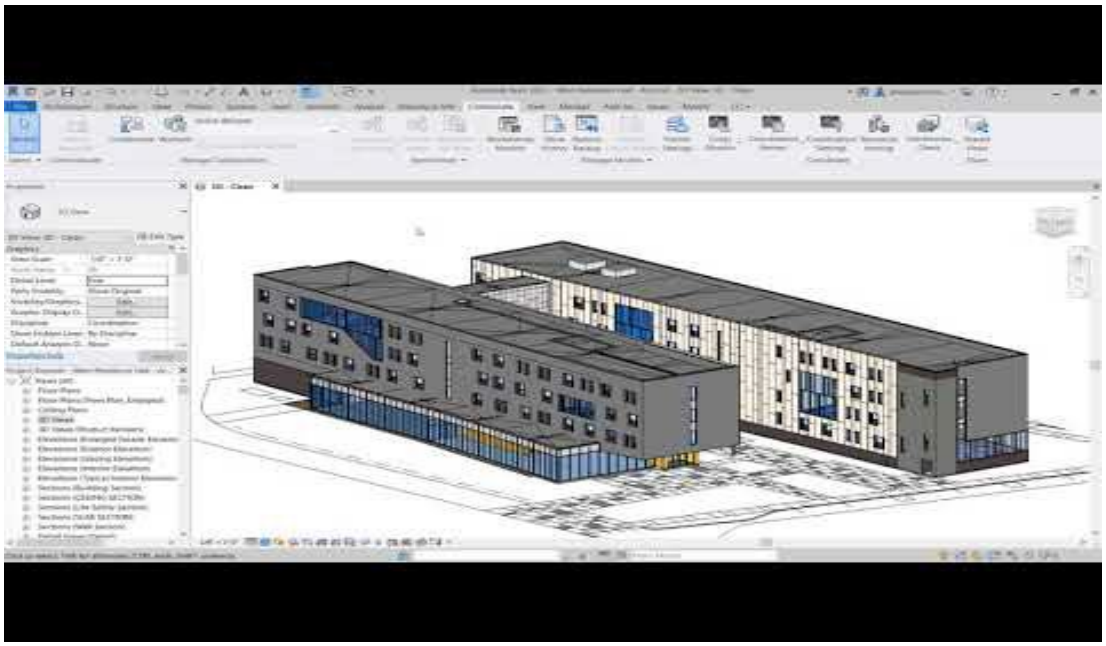


5.4.3 Uploading Revit Models to the cloud

After setting up the teams, it is possible now upload the Revit model into BIM 360.

This video teaches how to upload Revit models to the cloud. It is suggested that two folders “Architecture” and “MEP” be created, and the models corresponding to the discipline created previously in the Block VII tutorials loaded (Tutorial VII.3 - BIM Architecture And Terrain Models With Revit and Tutorial VII.4 - BIM MEP Model With Revit. An Introduction).

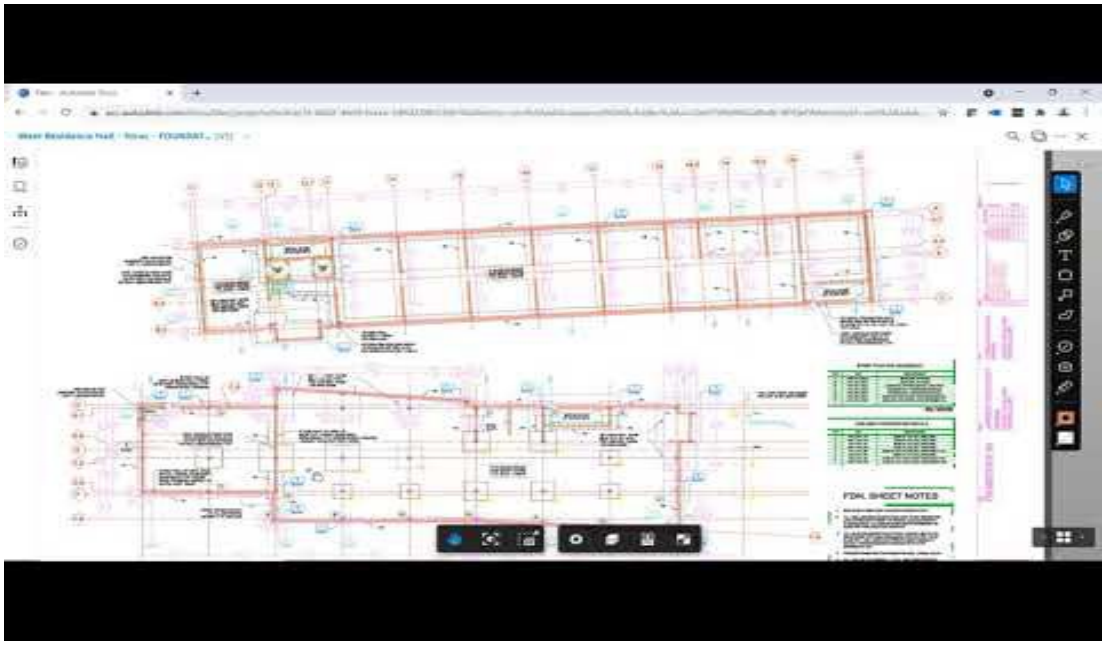
https://www.youtube.com/watch?v=wWmFRjsbSr0&list=PLY-ggSrSwbZqux3c7_GfNR5dgnTluBEYF&index=3



5.4.4 Uploading other Project Files to the cloud

The following video shows other types of file formats that can be uploaded to the cloud with BIM Collaborate Pro, such as dwg, pdf, ifc, or even Microsoft Office files (Word, Excel, PowerPoint).

https://www.youtube.com/watch?v=UU-hX-X1A3w&list=PLY-ggSrSwbZqux3c7_GfNR5dgnTluBEYF&index=4

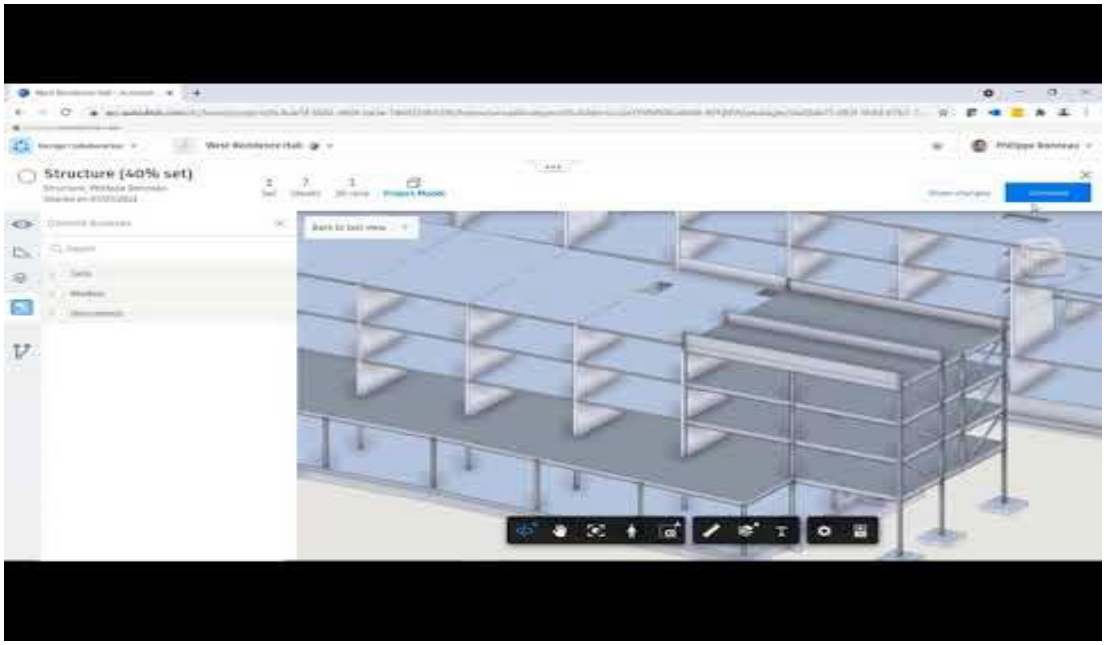


5.4.5 Creating and Consuming Packages

The term Package refers to the set of changes made by a project team and shared in the cloud for other teams to view. The package can contain the Revit template, IFC files, and more.

This video shows how packages are created and how other members view them.

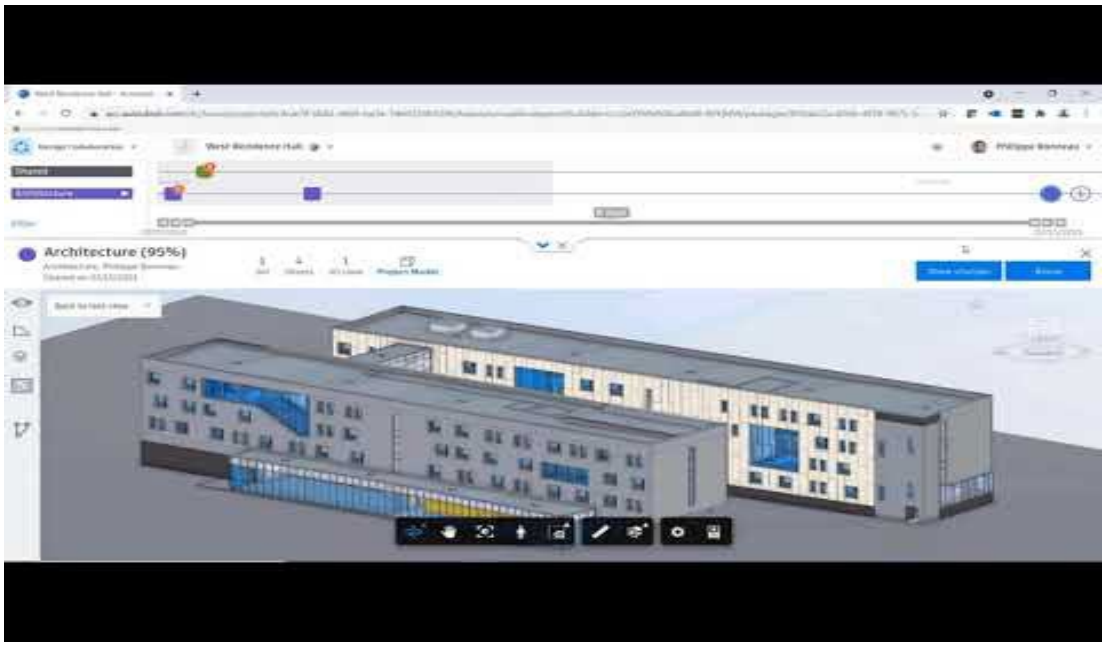
https://www.youtube.com/watch?v=H6ZWhry4130&list=PLY-ggSrSwbZqux3c7_GfNR5dgnTluBEYF&index=5



5.4.6 Sharing Design Changes

In the following video, an example of how to communicate project changes with teams and project members is shown.

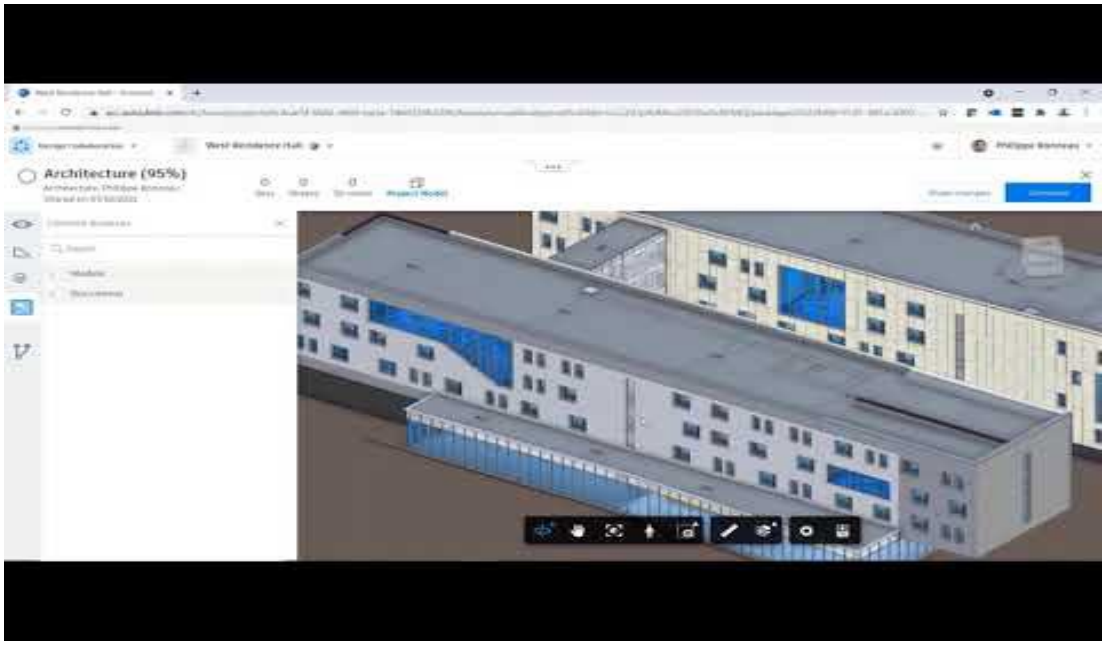
https://www.youtube.com/watch?v=GF7VC8YdUyc&list=PLY-ggSrSwbZqux3c7_GfNR5dgnTluBEYF&index=8



5.4.7 Reviewing Design Changes

This video shows an example of how a team receives the project update made by a team from another discipline, and how the impact of these changes on their discipline is evaluated using the change visualization tool.

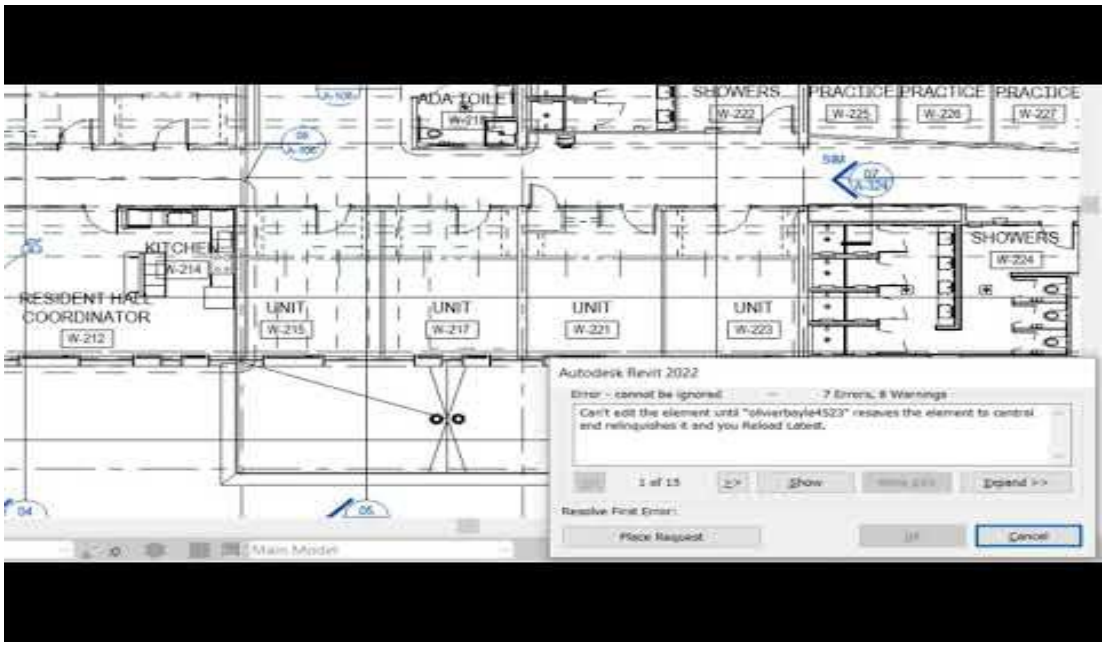
https://www.youtube.com/watch?v=CY4EXcTKsdc&list=PLY-ggSrSwbZqux3c7_GfNR5dgnTluBEYF&index=9



5.4.8 Revit Cloud Worksharing in BIM Collaborate Pro

The following video shown a situation in which different members work on the same project in Revit simultaneously, and is shown how to request permission and to make changes to elements so that there are no clashes while working simultaneously on the same model.

https://www.youtube.com/watch?v=n3eYSH_xZlA&list=PLY-ggSrSwbZqux3c7_GfNR5dgnTluBEYF&index=6

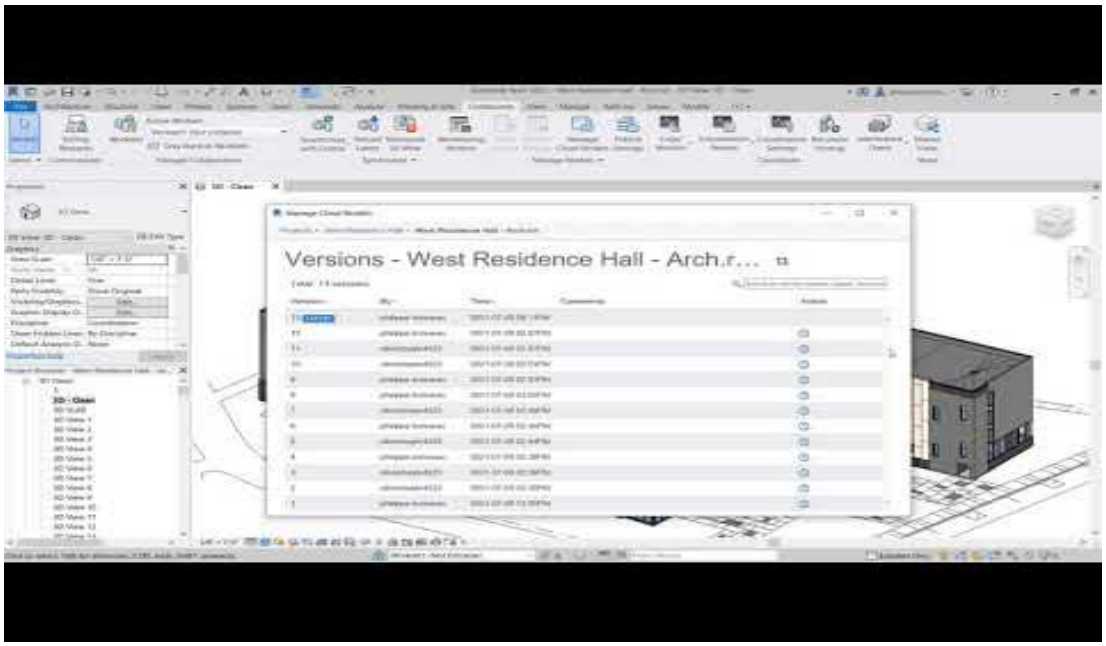


5.5 Manage Cloud Models

The video below shows how to view and manage Revit models in Autodesk BIM Collaborate Pro with the Manage Cloud Models tool.

With this tool, it is possible to view the model change history and change to a previous version directly to the cloud.

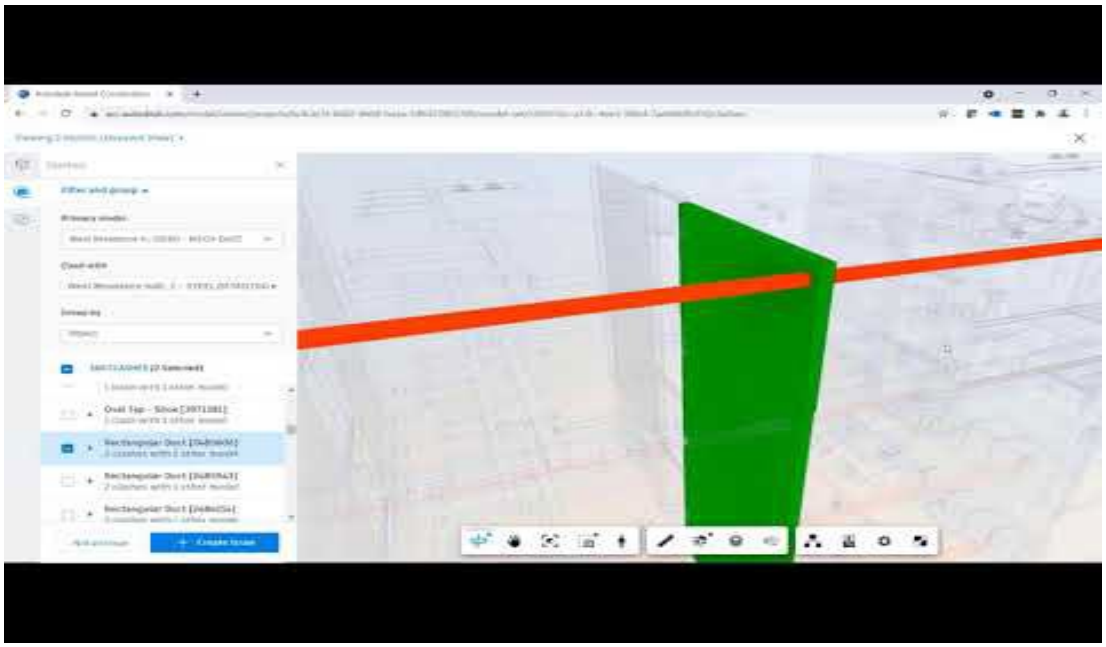
https://www.youtube.com/watch?v=4U6mzDx_2AA&list=PLY-ggSrSwbZqux3c7_GfNR5dgnTluBEYF&index=7



5.6 Clash Detection

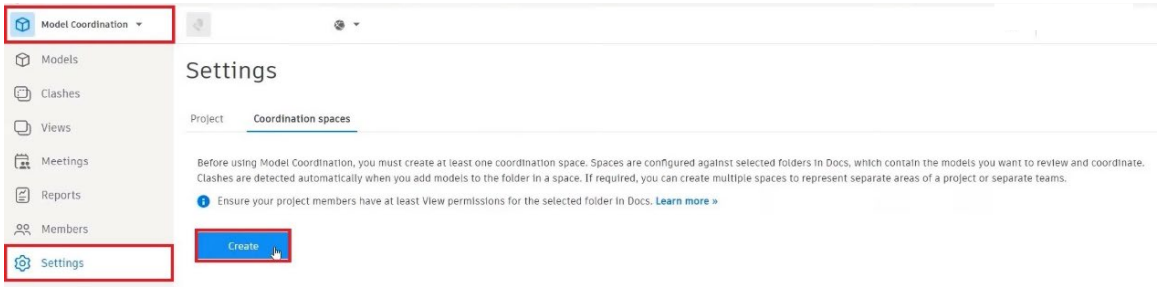
This video shows how to use the Model Coordination module in BIM Collaborate Pro to automatically perform Clash Detection on all models shared by the project team. With this tool, project members can view, manage, and resolve issues.

https://www.youtube.com/watch?v=iXxskmtLdAQ&list=PLY-ggSrSwbZqux3c7_GfNR5dgnTluBEYF&index=10

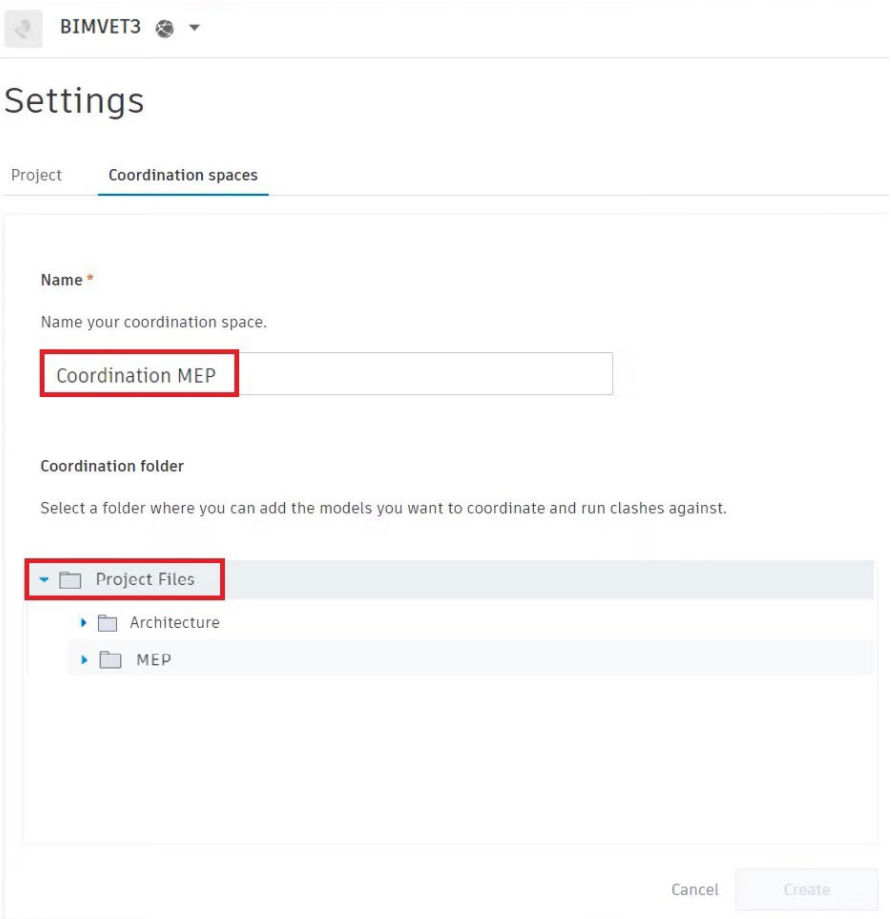


Based on the Revit models uploaded earlier (.rvt files *Tutorial VII.3 - BIM Architecture And Terrain Models With Revit* and *Tutorial VII.4 - BIM MEP Model With Revit)* and following the steps shown in the video above, a coordination space will be created to verify possible clashes between the Architecture model and the MEP model.

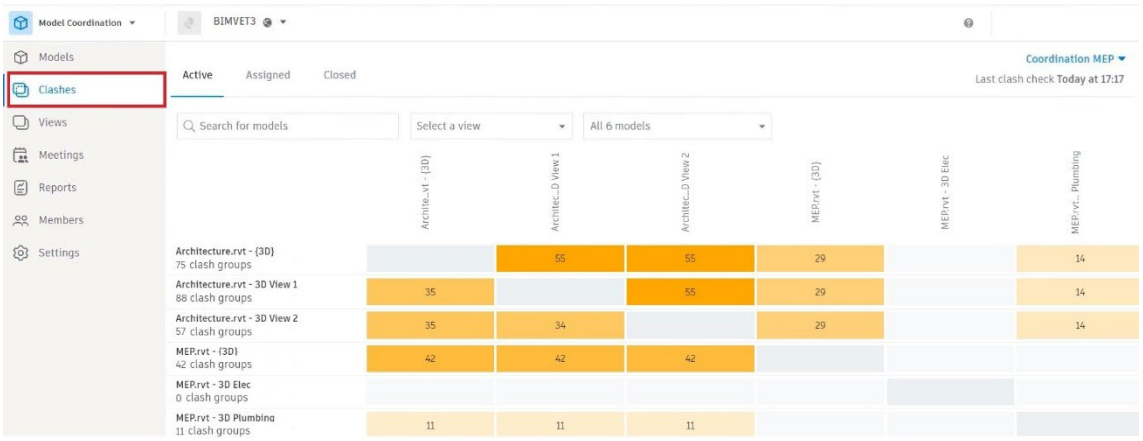
As indicated in the video, you must access the Model Coordination module. In Settings, you must click on “Create” to create a new Coordination Space.



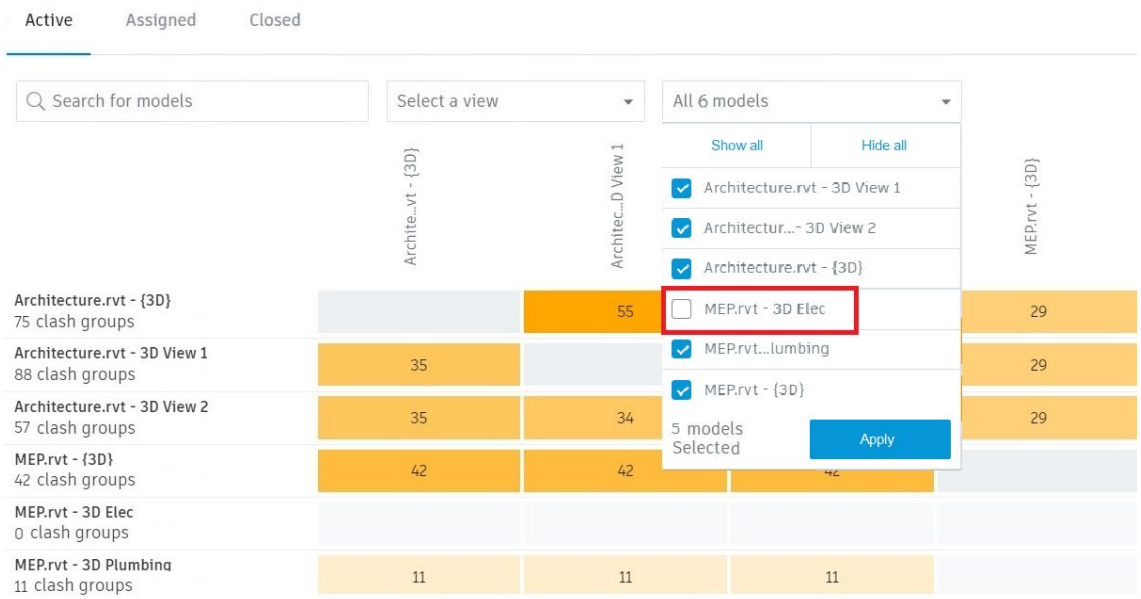
Next, you must name the Coordination Space, and select the folder to which you can add models to coordinate and use for Clash Detection.



After that, you must access the "Clashes" menu in which a matrix of Clash Detection results will be displayed.



The matrix shows the number of clashes between the models based on the files contained in the selected folder. You can select the models to display in the matrix, in this case you can clear the template "MEP.rvt - 3D Elec", because in the previously loaded file there is no electrical design element, so no clashes will appear.

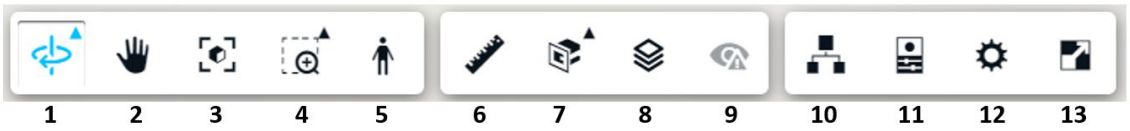


Clicking on the matrix number will display the possible clashes found in a 3D model. As a demonstration, clashes between the model "MEP.rvt" and "Architecture.rvt" will be used, as shown below:

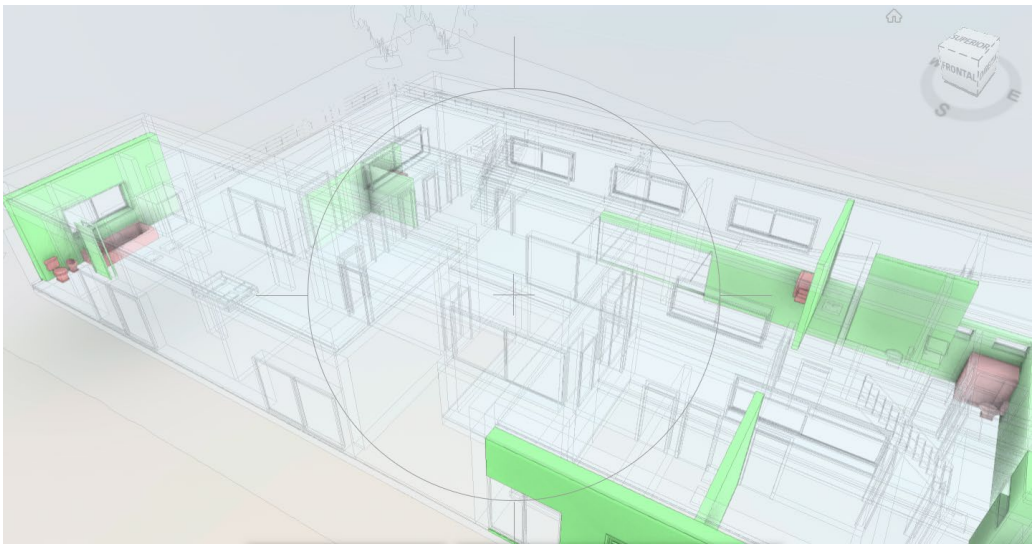
	Archite...vt - {3D}	Architec...D View 1	Architec...D View 2	MEP.rvt - {3D}	MEP.rvt - 3D Elec	MEP.rvt... Plumbing
Architecture.rvt - {3D} 75 clash groups		55	55	29		14
Architecture.rvt - 3D View 1 88 clash groups	35		55	29		14
Architecture.rvt - 3D View 2 57 clash groups	35	34		29		14
MEP.rvt - {3D} 42 clash groups	42	42	42			
MEP.rvt - 3D Plumbing 11 clash groups	11	11	11			

A page will load that displays the 3D model, with possible clashes found identified by colours.

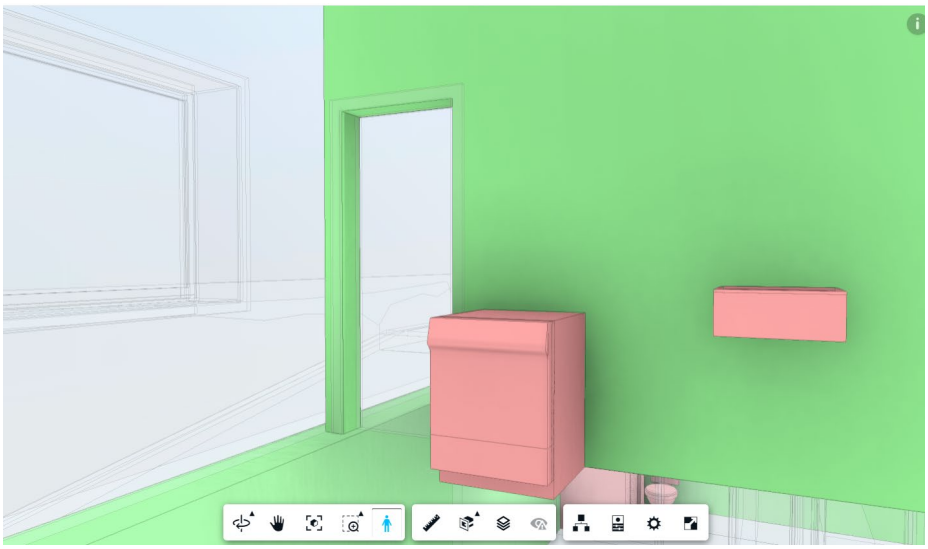
In the lower toolbar, some tools are located that make it easier to navigate the model.



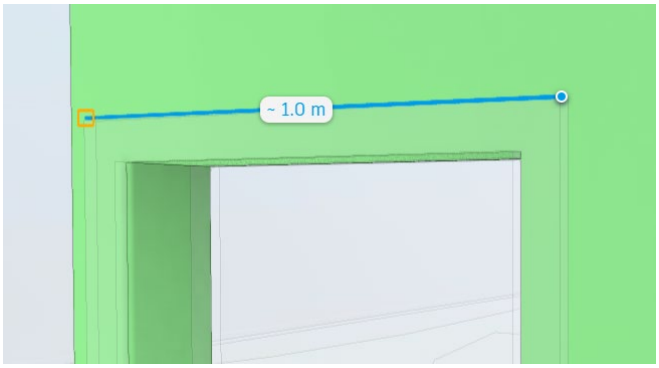
1- **Orbit:** allows you to orbit the 3D view with mouse movement (this function can also be performed through the view cube located in the upper right corner).



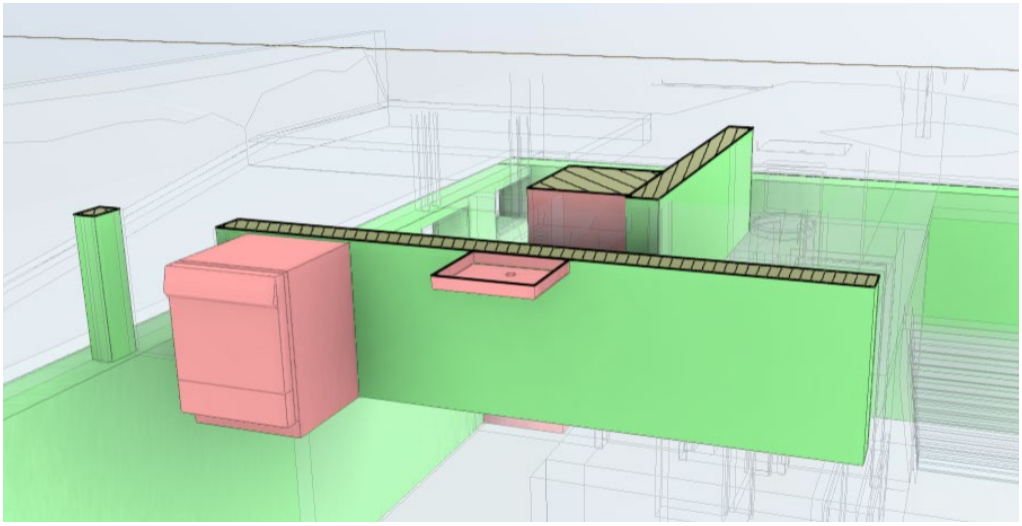
2- **Pan:** Allows you to drag the view of the model with the mouse movement, without orbiting it.
3- **Adjust view:** Returns to the full 3D view of the model.
4- **Zoom window:** Allows you to select a specific area of the model to zoom in.
5- **First person:** It is an interesting tool in 3D visualization, as it allows the user to visualize the model as if it were really inside the building.



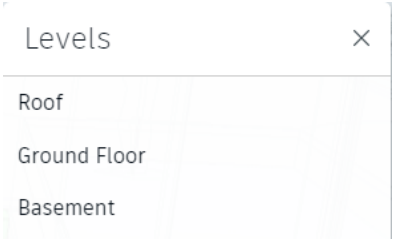
6- **Measure:** Allows you to measure the distance between two points.



7- **Add section plane:** Allows you to add planes (in X, Y, or Z) or create a Section Box to crop a particular view of the model.

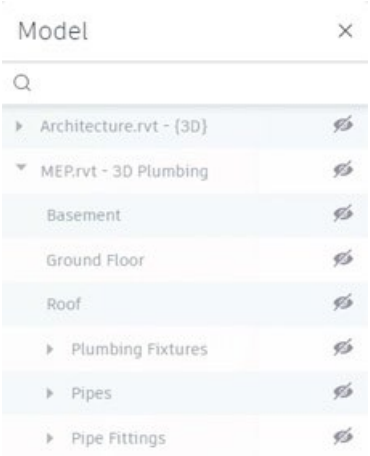


8- **Levels:** Allows the user to select which level of the model to view.



9- **View issues:** Allows you to view the problems already assigned to the model (in this case, not yet).

10- **Template browser:** Allows you to hide/display model elements



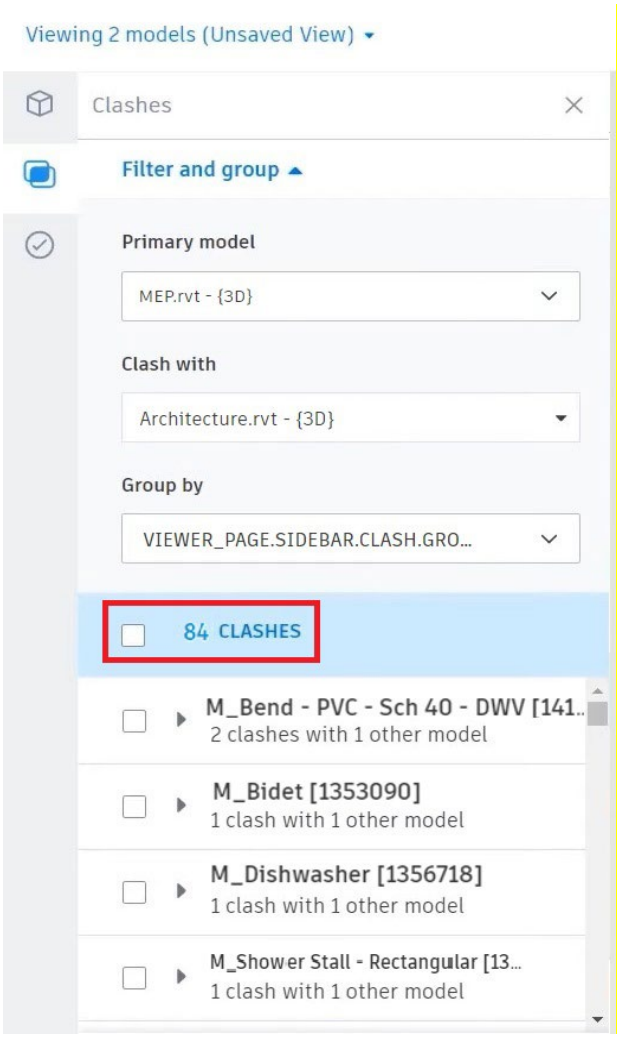
11- **Properties:** Displays the properties of the selected element.

12- **Settings:** Allows the user to customize navigation, appearance, and environment settings according to preferences.

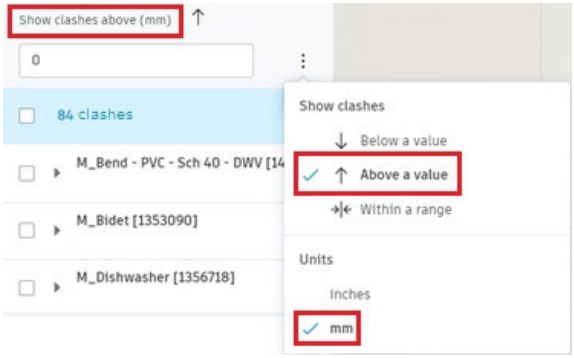
13- **Full screen:** full-screen view of the 3D model.

Now that you know the main navigation tools, you can start analysing the clashes detected. Between these two models, 84 clashes were pointed out.

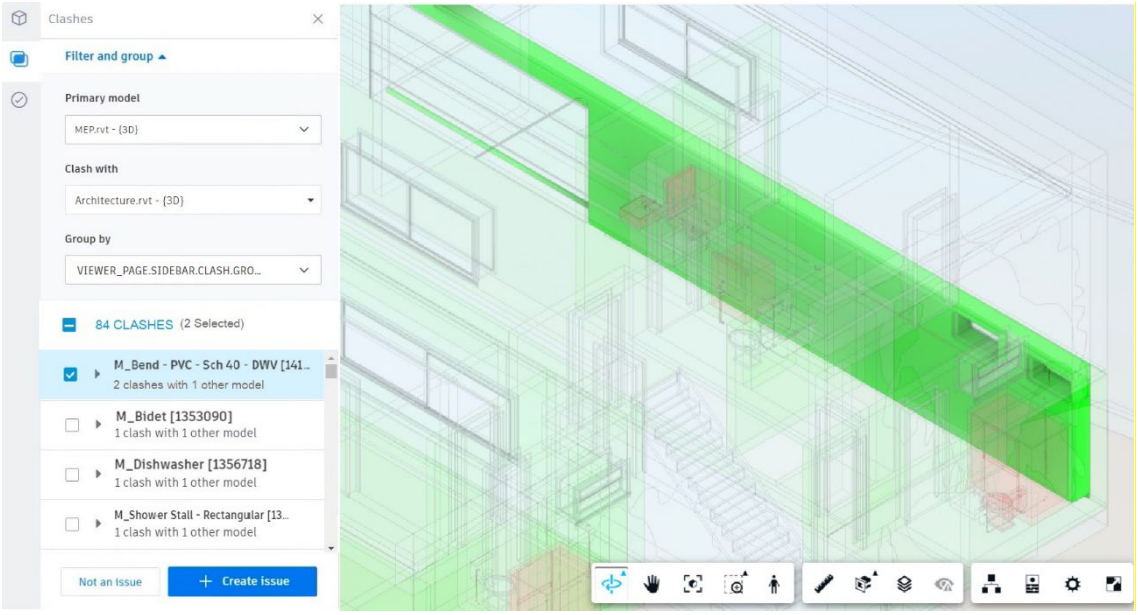
> **Note:** It is important to note that the clashes demonstrated in this tutorial may be different, as it depends on how the cold-water network was developed by each student in *Tutorial VII.4 - BIM MEP Model With Revit.*



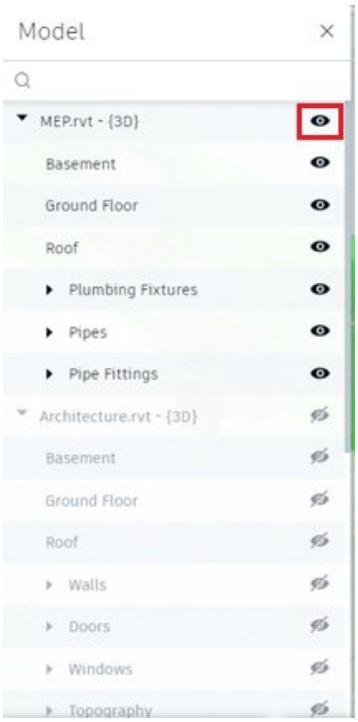
In "Show clashes above" you can select the unit of measure (will be kept in mm) and also the accuracy of the test (above, below or exactly certain value, will be kept 0mm)



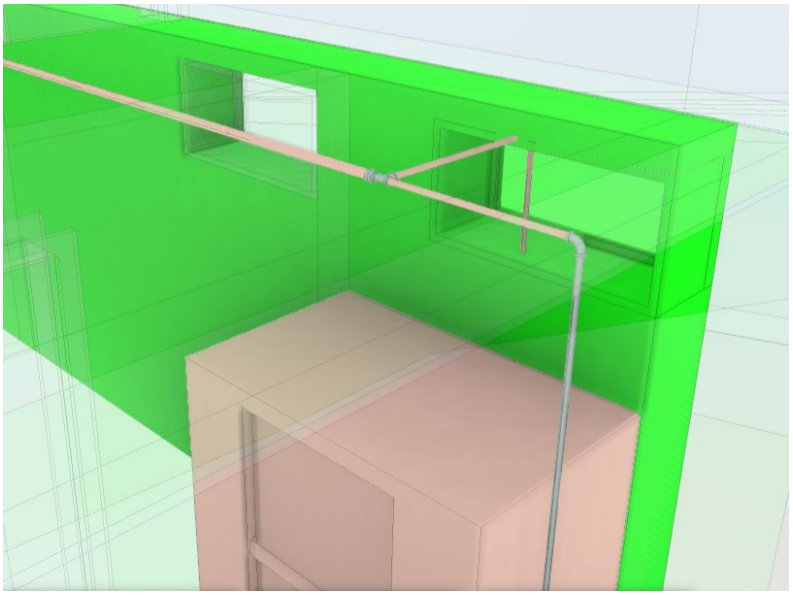
When you mark one of the clashes shown in the list, the 3D view is automatically positioned to show the element that is in potential clash.



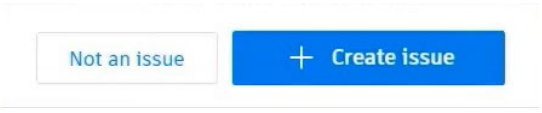
The preview is not very clear, so to improve it you must select the Model Browser tool , and mark the MEP option, so that the MEP elements model are visible.



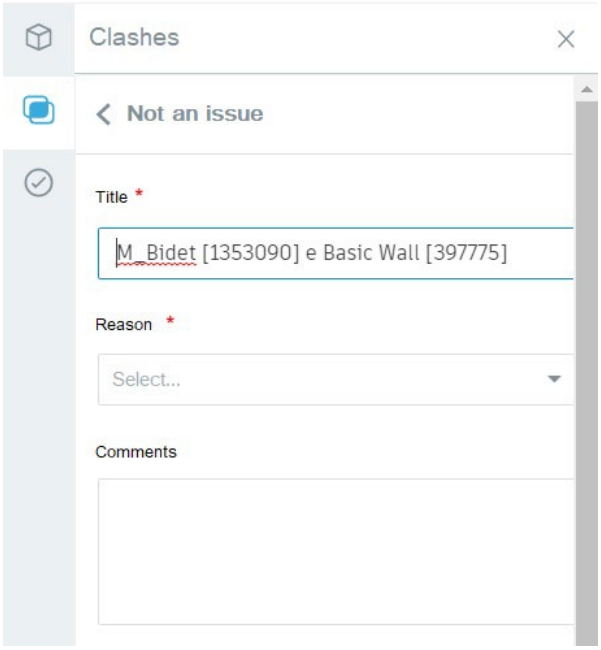
Now it is already possible to better visualize the pipes and plumbing fixtures. It is noted that there is a pipe that passes through a window opening.



In this case, there are two options, ignore the clash and select the option "Not an issue", or else choose the option "Create issue" to fix it. Both situations will be exemplified below.

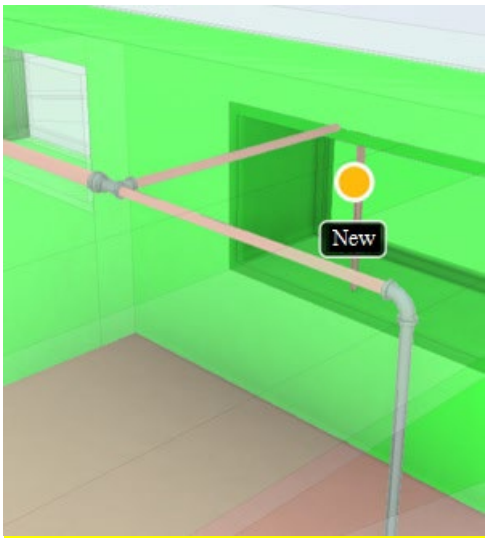


When you select the "Not an issue" option, you must assign a Title and also a Reason. Some possible reasons why the location is not an issue are suggested. You can also add comments.

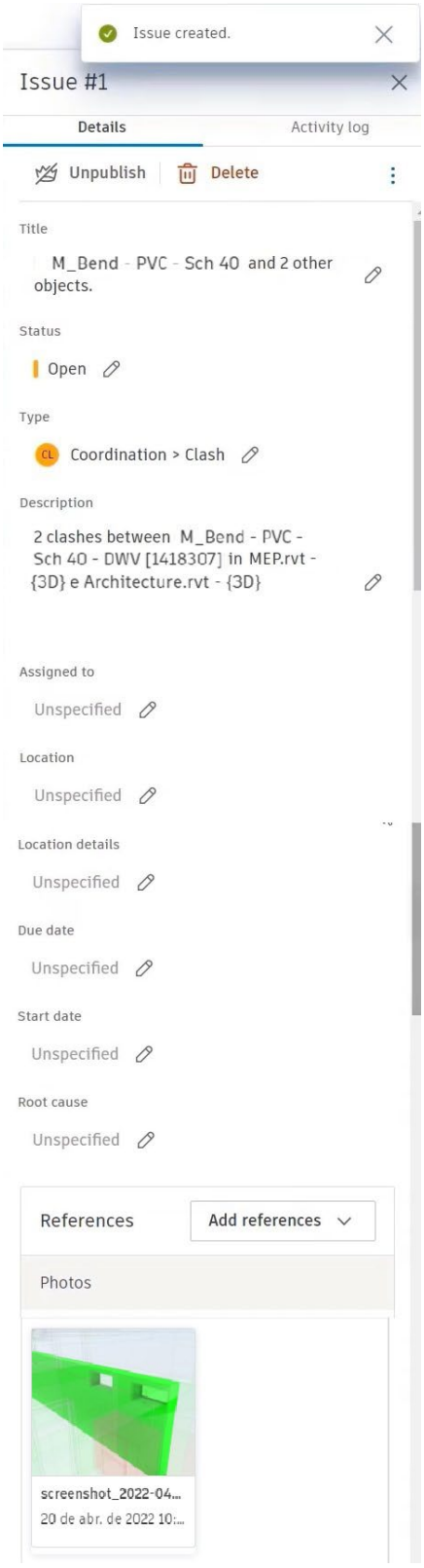


Click on "Cancel" to return to the previous page.

By clicking on the "Create issue" option, you will then be prompted to insert a pin into the element to be modified, as in the image below.



On the right side of the page, a window will open to fill in with information about the issue created. When working in teams and the issues are assigned to other members, it is very important that the issue information is filled with as much details as possible, so that the other member knows exactly what should be done to fix the issue.


Issue created.
Issue #1
Details
Activity log
Unpublish
Delete
Title
M_Bend - PVC - Sch 40 and 2 other objects.
Status
Open
Type
Coordination > Clash
Description
2 clashes between M_Bend - PVC - Sch 40 - DWV [1418307] in MEP.rvt - {3D} e Architecture.rvt - {3D}
Assigned to
Unspecified
Location
Unspecified
Location details
Unspecified
Due date
Unspecified
Start date
Unspecified
Root cause
Unspecified
References
Add references
Photos
screenshot_2022-04...
20 de abr. de 2022 10:...

It is recommended that all possible clashes between all models of the matrix be visualized and evaluated, and to classify them as a problem or not.

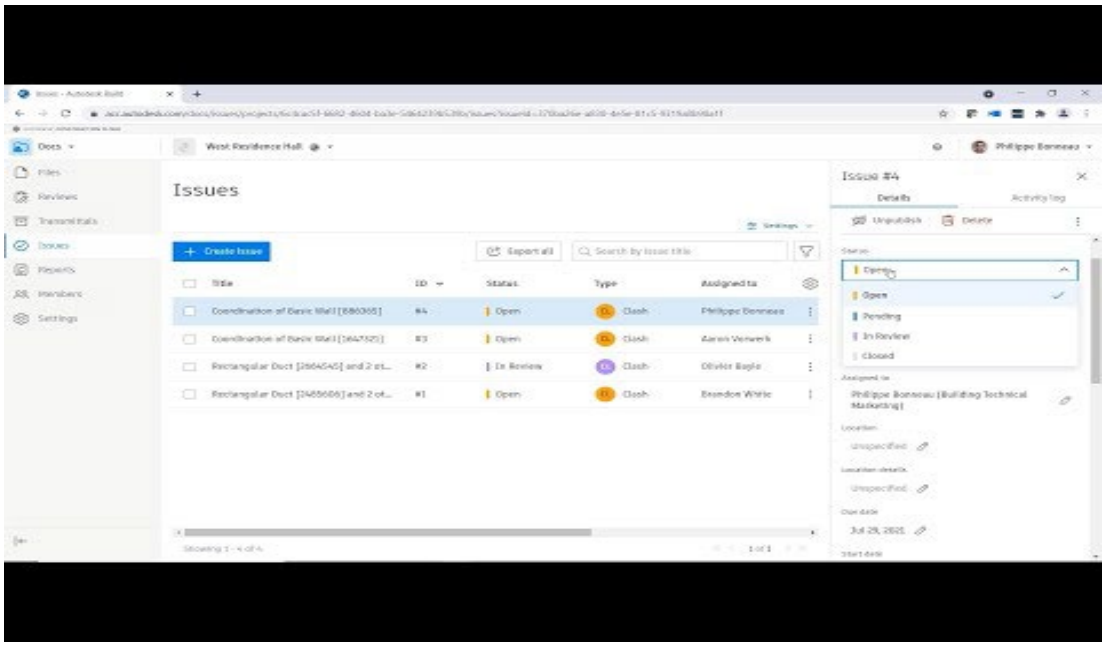
The solution of the problems found is done directly in the model in Revit, that is, you must resize the network layout and/or reposition the plumbing fixtures according to the clashes detected in the Revit work environment. After saving the edited template in Revit, it will automatically update in BIM Collaborate Pro.

After the corrections have been made, you must recheck the clashes in the model on BIM Collaborate Pro.

5.7 Issues Management

The following video teaches how to manage issues in BIM Collaborate Pro, Revit, and also Navisworks.

https://www.youtube.com/watch?v=L6rS8U5m_7I&list=PLY-ggSrSwbZqux3c7_GfNR5dgnTluBEYF&index=11



5.8 Insight Module

The Autodesk Construction Cloud Insight module is briefly presented in the video below. This module provides an overview of the project and is customizable according to the needs of each user.

https://www.youtube.com/watch?v=dmr1wbjGJxw&list=PLY-ggSrSwbZqux3c7_GfNR5dgnTluBEYF&index=12