CS322684

Optimizing Assemble Using BIM 360

Anthony IANDIORIO | BIM Manager BIM-VDC
Graitec

Eric BERNIER | Technical Director BIM-VDC
Graitec

Learning Objectives

- Learn how to create a new project in Assemble
- Learn how to link a BIM 360 file to Assemble
- Learn how to reorganize data per budget cost codes
- Learn how to complete a cost estimate analysis

Description

Increase productivity and profitability in your construction-estimation department with strategies on how to successfully integrate Assemble systems with BIM 360 software. This class will cover the simplicity of setting up an Assemble project and linking it to a BIM 360 account in order to preserve a single source of truth and maximize on the 3Cs(Coordinate, Collaborate, Communicate) in BIM. We'll also cover best practices and offer more tips and tricks that will enable a more fluid workflow.

Speakers

Anthony IANDIORIO, eng.:
Position: BIM-VDC Manager, Graitec Canada
Contact: anthony.iandiorio@graitec.com

Anthony is a civil engineer with a strong background in the construction industry and a burning passion for technology. Having served the construction industry for over 11 years he has grown his experience working as a labourer to project management and beyond. His journey after university debuted on site as many young engineers where he complimented his site experience by learning the ins and outs of quality control and site coordination. He then pursued project planning, claims and until his current position he worked for a developer in commercial real estate; it's fair to say he's been exposed to all phases of a construction project.

Over the years, Anthony is surprised how behind Quebec construction is with the digitization of its workflows which has led him to his present role as a BIM manager for Graitec Canada. He is very proud to be at the forefront of BIM as he works hard every day to inspire change in his local construction industry. Within Graitec, Anthony consults local companies with the implementation, training, coaching, and BIM project management.

Eric BERNIER:
Position: Technical Director, Graitec Canada
Contact: eric.bernier@graitec.com

Eric is a Senior Architectural Technologist with more than 22 years of experience who began to use Revit since Autodesk acquired it. He is the founder of the Quebec BIM User Group. Eric also worked for an Autodesk reseller as BIM technical director, overseeing the AEC teams and implementing Revit. He was also BIM Leader of multiple projects; a 1.4M sqft hospital project, university science building project, etc...

After working in architectural firms for many years and for McGill University's facilities management department, Eric was hired in an Autodesk reseller company and 3 years later, founded his own BIM consulting company in 2009 with 14 employees and 2 offices (Montreal and Quebec city) which provided services for implementation, training, coaching, BIM project management, BEP, and change management.

In late 2018, Zenit Consultants merged with Graitec Canada after 10 years of consulting. Eric is now Technical Director BIM-VDC for Graitec, taking care of the Canadian and United States offices. With his experience as a company owner, Eric developed his sense of efficiency and is very fond of best practices and intelligent tools to make our lives easier. His specialisation is more than only modelling tools but also encompasses Agile management methods, project management tools which he offers to his clients.

Introduction

This conference will take you deeper into the workflows in Assemble and BIM360. Our main objective is to share our experience with Assemble for all AEC professionals and demonstrate the value that BIM360 adds to simplify your workflows in order to win your projects in preconstruction and stay on track during construction.

Your Role as an Owner and/or Operator

Owners are the key to any project as they provide the vision and capital based on their need for growth. Once constructed facilities become enterprise asset they must be operated and maintained over the course of their lifespan (+/-50 years) and to do so operators require a minimum set of information regarding equipment; enter BIM.

Your Role as an Architect / Engineer

Professionals are the first in the project development phase with the key role of ensuring that the needs of the owner's capital project are designed to any and all pertinent regulations. Thus, since this is the starting point of BIM it is crucial to prepare models that have great structure to meet the needs of all stakeholders.

Your Role as an Estimator

With the increasing demand for projects and more so the accelerated pace required by owners the estimator must be able to produce budgets at the snap of a finger in order to assess constructability and conformance to client budgets.

Your Role as a Project Manager

The project manager's role is to ensure that the project is executed smoothly according to the quality specifications, the master schedule, and most importantly per the established budget. It is pertinent then that managers require rapid data extraction.

BIM, Tying the Group Together

Do you see the pattern? BIM is great when stakeholders can access the information quickly in order to perform each of their responsibilities: hello Assemble! With this tool, each of the parties can now leverage the data rich environment of a model without extensive training on modeling software such as Revit.

In the owner's perspective, a well-executed BIM deliverable is priceless at handover; the digital twin is a valuable asset as it contains all the necessary information for operations. The key then is how to quickly isolate information from a data rich model.

Since the focus of our discussion is project estimating, we will see how Assemble is incredibly powerful for take-offs and budgeting. Add-ins such as Excel, Power BI and the desktop Class Editor offer the ability to create custom back end calculations and clear data representation making it easier for high level analysis.

On the project execution end, the link to BIM360 adds value by allowing managers to link project documentations directly from their BIM360 account. Furthermore, users could create, and track issues specifically detected in the Assemble cloud.

Let's begin……

Create a New Project in Assemble

The process of creating a new project is very easy, but we must first create an account.
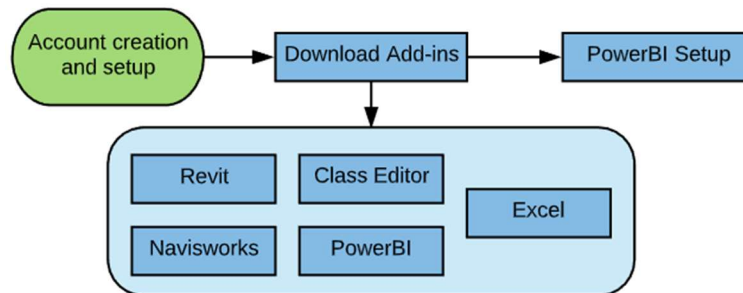
Create account / login

Very easy to do, just enter your information or login with your Autodesk Account on the webpage. Once the account is created, we strongly suggest bookmarking the website on your favorite toolbar in your preferred web browser.

Assemble Account Login.

Get add-in and set them up

Add-ins will permit you to link different software with Assemble. Add-ins of interest to this presentation are the Class Editor, the Excel and PowerBI add-ins. Just go to this webpage to download them : https://assemblesystems.com/resources/#term-downloads

Moving Forward Togethe

In addition to BIM solutions, Assemble Systems is committed to providing pr   tools needed to grow, improve and optimize outcomes for each and e

CLASS EDITOR (DOWNLOAD)

Class Editor Download ...

SCHEDULE INTEGRATOR ADD-IN (DOWNLOAD)

Schedule Integrator Add-in ...

EXCEL ADD-IN (DOWNLOAD)

Excel Add-in ...

POWER BI FILES (DOWNLOAD)

Power BI Files Download ...

Assemble Add-ins.

For the PowerBI templates, be sure to extract the .pbit files to a common file called **Microsoft Power BI Desktop** in Documents located on you PC.
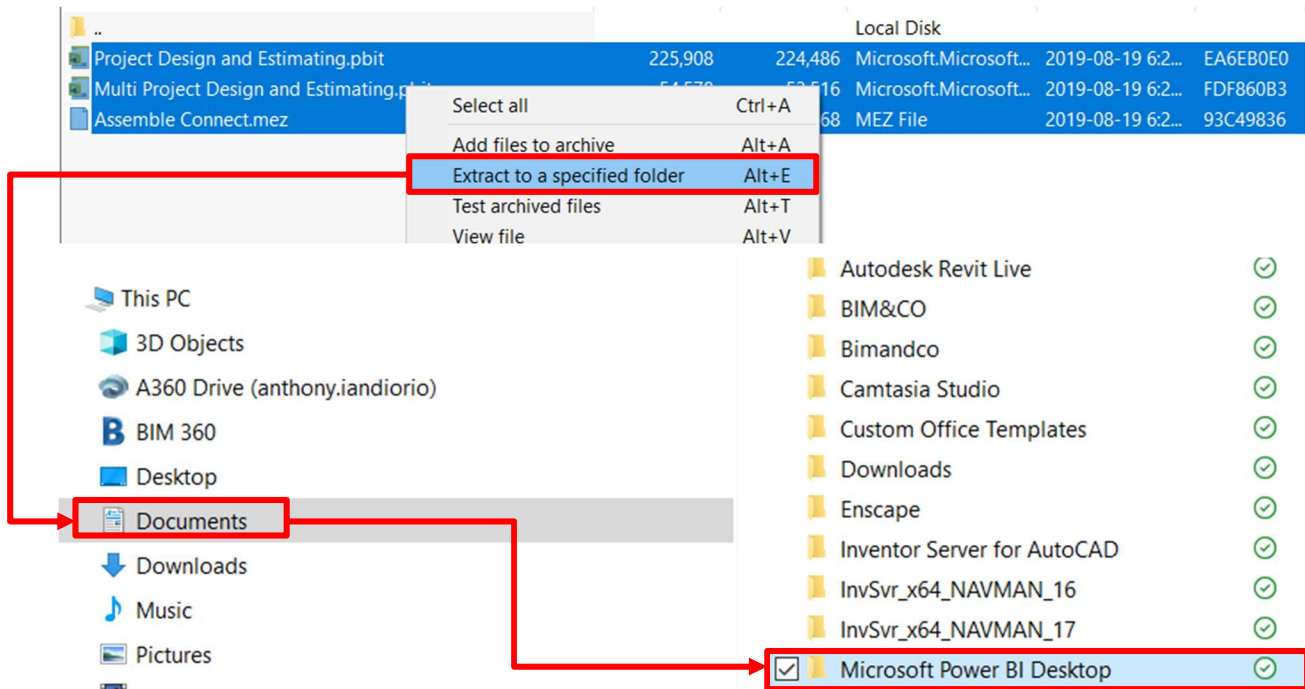
Before opening any Assemble template (.pbit) file make sure to adjust your PowerBI security settings, otherwise you risk getting the "Uncertified Connectors" pop-up.

In order to adjust settings, open Power BI and in the **File** tab select **Options and settings** followed by **Options**.
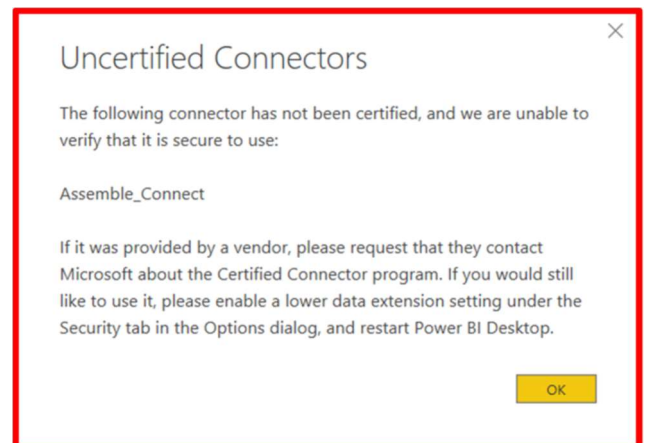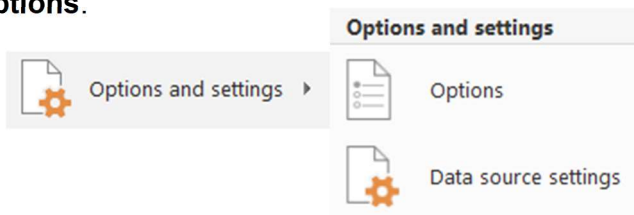
With the **Options** tab opened, select the same options as you see below and you're ready to import your Assemble Data.

Options

Native Database Queries
☑ Require user approval for new native database queries

Web Preview Warning Level ⓘ
Moderate ▾

Data Extensions
○ (Recommended) Only allow certified extensions to load
⦿ (Not Recommended) Allow any extension to load without validation or warning

Learn more about data extensions

Custom visuals
☑ Show security warning when adding a custom visual to a report

ArcGIS Maps for Power BI
☑ Use ArcGIS Maps for Power BI

Approved ADFS Authentication Services ⓘ
ⓘ You have not approved any authentication services on this computer.

OK   Cancel

Options

Privacy Levels
○ Always combine data according to your Privacy Level settings for each source
○ Combine data according to each file's Privacy Level settings
⦿ Always ignore Privacy Level settings ⓘ

Learn more about Privacy Levels

OK   Cancel

Options

Preview features
The following features are available for you to try in this release. Preview features might change or be removed in future releases.

☑ Shape map visual   Learn more
☑ M Intellisense   Learn more
☑ Spanish language support for Q&A   Learn more
☑ Get data from PDF files   Learn more
☑ Enable column profiling   Learn more
☑ Show dates as a hierarchy in the fields list   Learn more
☑ Python support   Learn more
☑ Incremental Refresh Policies   Learn more
☑ Manage Aggregations   Learn more
☑ Enable fuzzy merge   Learn more
☑ Modeling View   Learn more
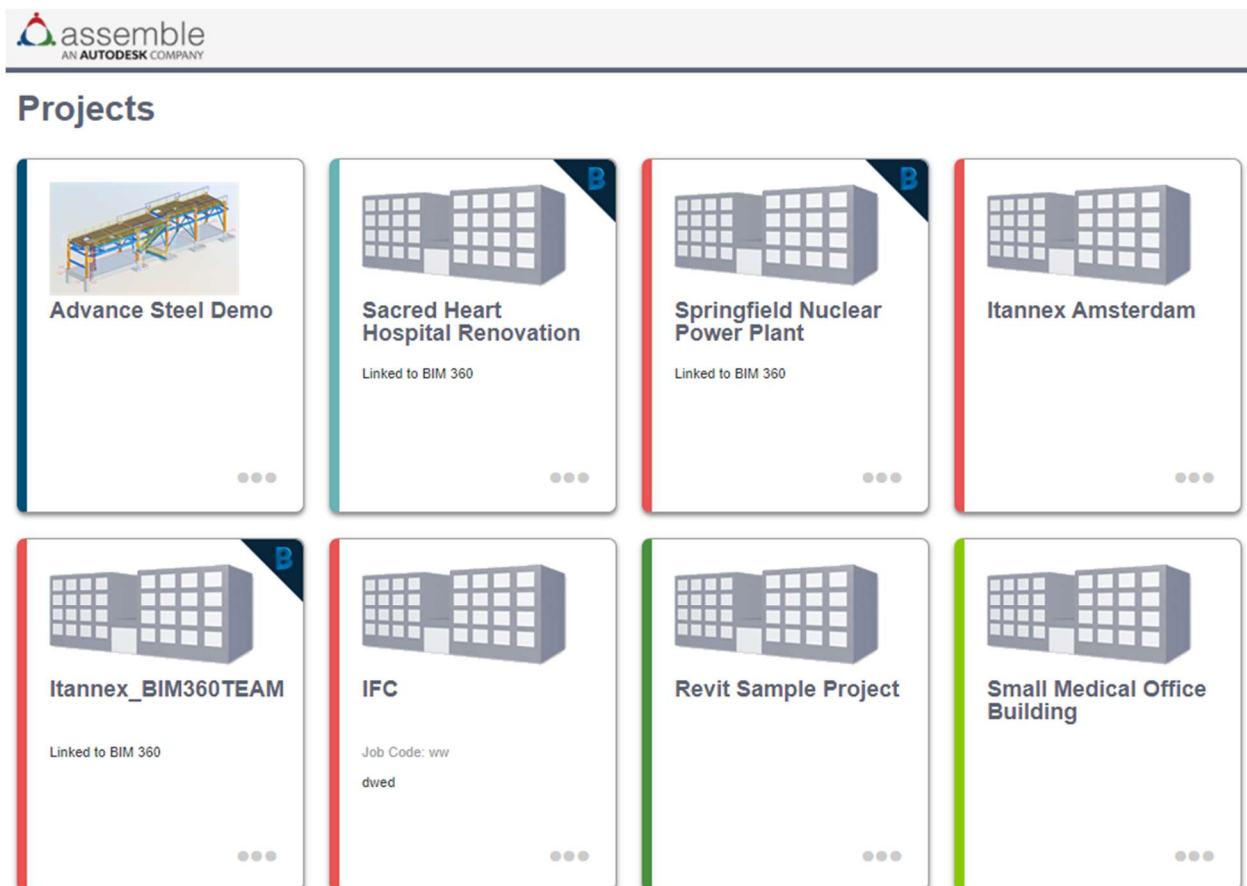☑ New filter experience   Learn more

OK   Cancel
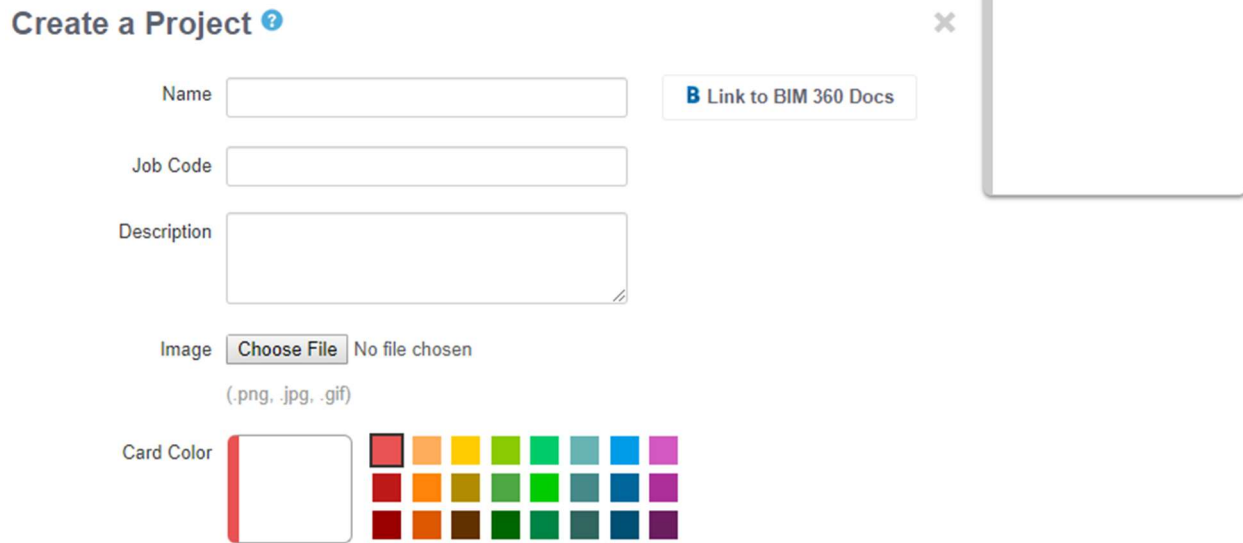
PowerBI Setup

Create new project
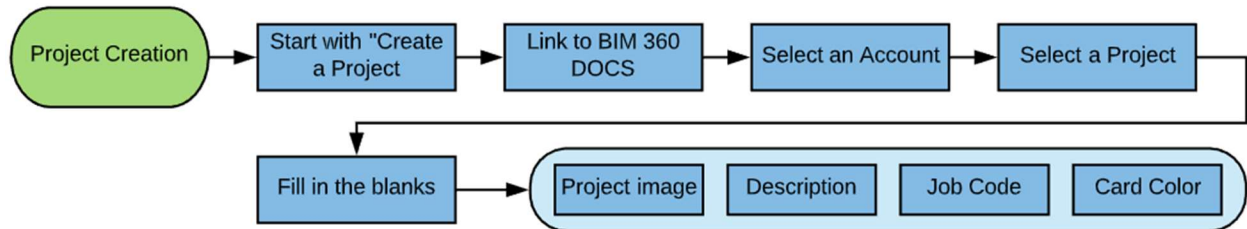
When logged in Assemble, you can see a bunch of cards representing different projects as these ones.:

Project cards in Assemble.

The last card is usually named Create a project, so just click on it.

Create a project

Then you'll see this dialog box below :

Create a Project ❓

Name _____   **B** Link to BIM 360 Docs

Job Code _____

Description _____

Image [Choose File] No file chosen
(.png, .jpg, .gif)

Card Color [ ]

Project creation dialog box

You will notice a button at the right corner saying: **Link to BIM 360 DOCS**. If you click on it, you'll get this dialog box shown below to select a BIM 360 account. Usually, you will only have your company account, but it might happen that others appear if you are invited to other hubs.

Once you have selected the Account, you must select the project and click **Link** at the bottom right. Automatically, the system will give the same project name and enter in the description that it is linked to BIM 360. You can add the project Code, a description and a card color if you wish.

Select BIM 360 Account
Select the BIM 360 account to browse its projects.

- Eric Bernier
- BIM 360 Projects
- Abcp architecture
- MLS Architectes inc.
- GRAITEC Inc.
- bim5d.org
- Magil Construction

Select BIM 360 Project
Select the BIM 360 project to link

- SAQ
- Blokable
- Formation Graitec
- BGLA
- ADM
- Blondin-Fortin
- Blondin Fortin Analyse
- Enerkem
- CHUM
- AU2019

Account and project selection in Assemble

Filled Project creation dialog

You'll notice that in the top right corner of the card the BIM 360 Logo indicating it is linked, compared to another card that is not.

Projects

AU2019

Linked to BIM 360

Advance Steel Demo

Project Cards
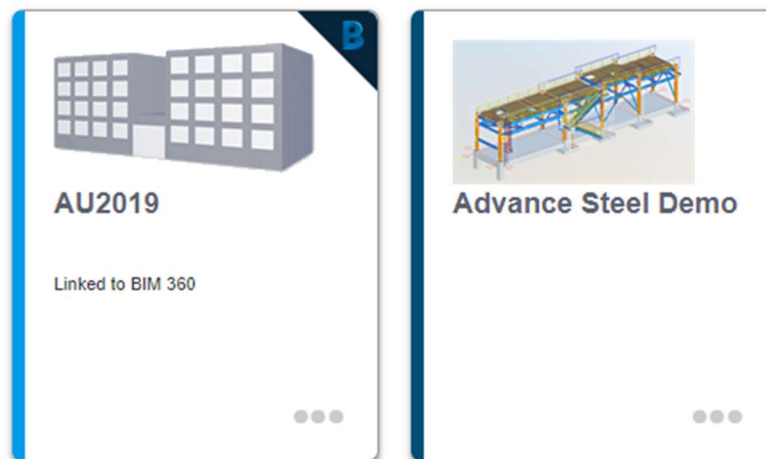
You can still link an existing project by opening its card and navigating to the Edit Project tab and following the same procedure outline above.

Project setup and loading Revit files
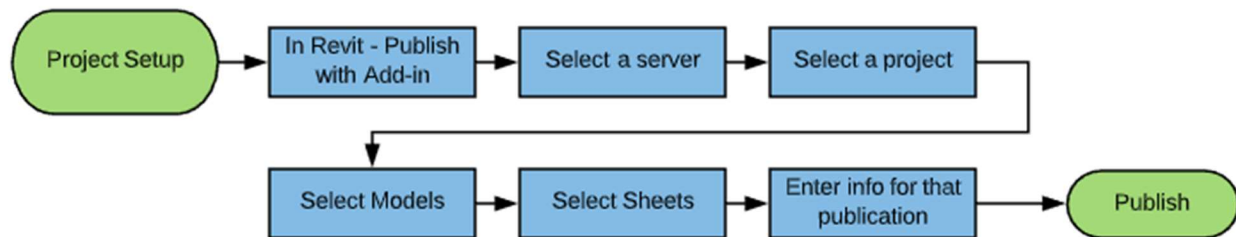
Once the project is created and linked to BIM360, you still have to upload the .rvt files from Revit to Assemble (yes, we know, they are in BIM 360, but for Assemble to connect properly, you have to install the add-in and push the file with Revit).

In Revit, use your newly installed Revit add-in and choose your server or type it in; this will connect Revit to the selected Assemble project.
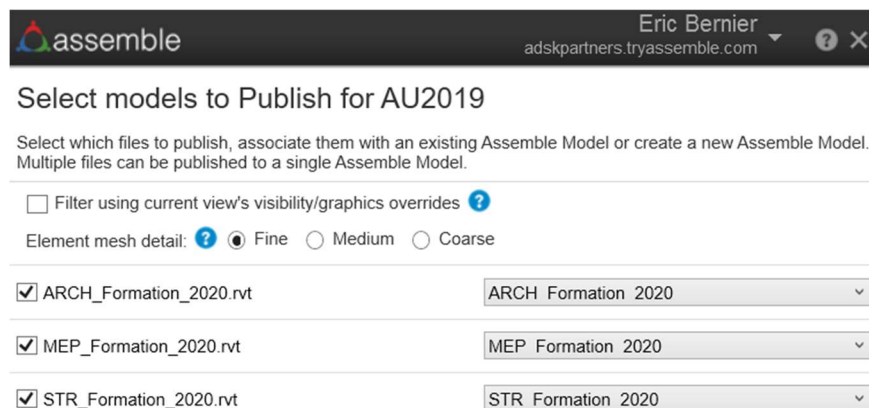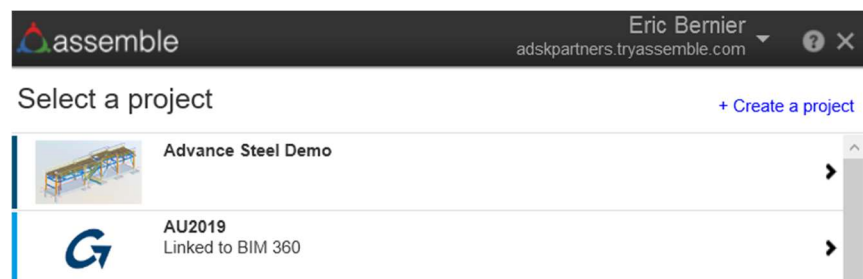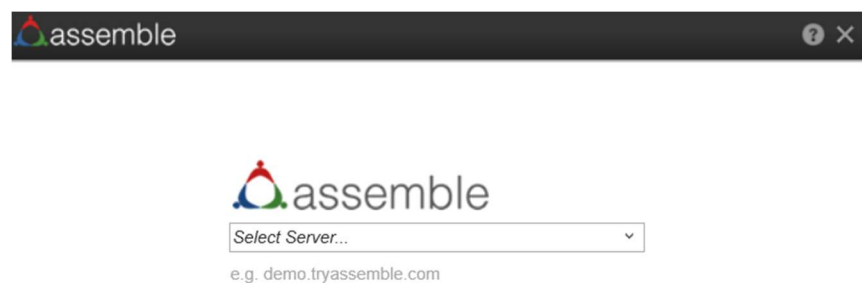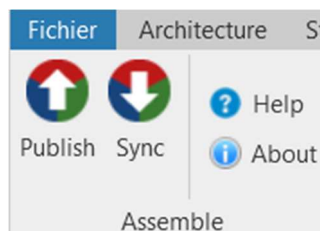
Steps to push Revit file to Assemble

Select sheets

○ Publish sheets from the Revit sheet set:

Toutes les feuilles + 3d ▾

❓ Help with Revit Sheet Sets

◉ Publish all sheets in the current Revit project

○ Do not publish sheets. Only publish 3D and model data.

Publish a new version of your models to AU2019

Version Name	50%

Previous Versions

Version Comment	For Demonstration

Steps to push Revit file to Assemble

Publishing models

ARCH_Formation_2020	⚙ Analyzing
ARCH_Formation_2020.rvt	Analyzing
MEP_Formation_2020	Queued
MEP_Formation_2020.rvt	Queued
STR_Formation_2020	Queued
STR_Formation_2020.rvt	Queued

Publishing status

AU2019

Search by name   press enter to select

MODELS

ARCH_Formation_2020	•••

ARCH_Formation_2020_detached	•••
3942 objects	2019-11-01

MEP_Formation_2020	•••
4546 objects	2019-11-01

STR_Formation_2020	•••
603 objects	2019-11-01

Don't worry, if you have a lot of different models linked it is normal that the upload could take a little while…it may be time for a coffee break!

Once this is done, you will see all the models you uploaded (side image).

Model's list in Assemble

Link a BIM360 File to Assemble

The reason we want to link a file to Assemble is to have full access to key project information in our BIM360 DOCS.
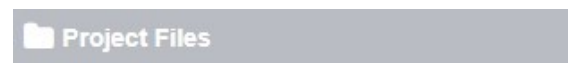
How to link files to objects
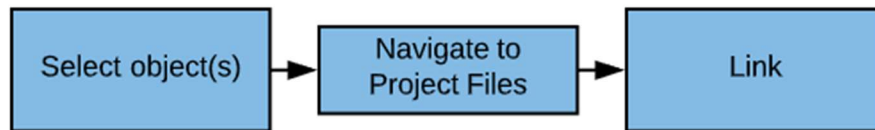
Firstly, you must make sure you are signed in for the project file. Click on a model and go in Project files to select sign in to BIM 360. Once done, you'll see the same file structure as in BIM 360.
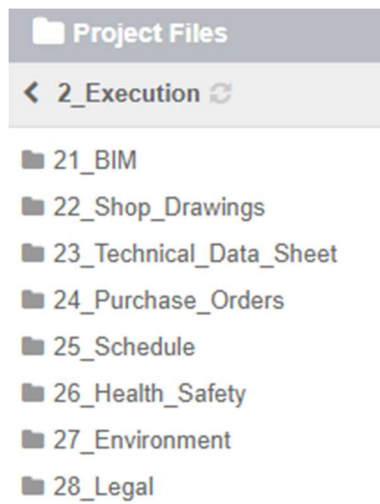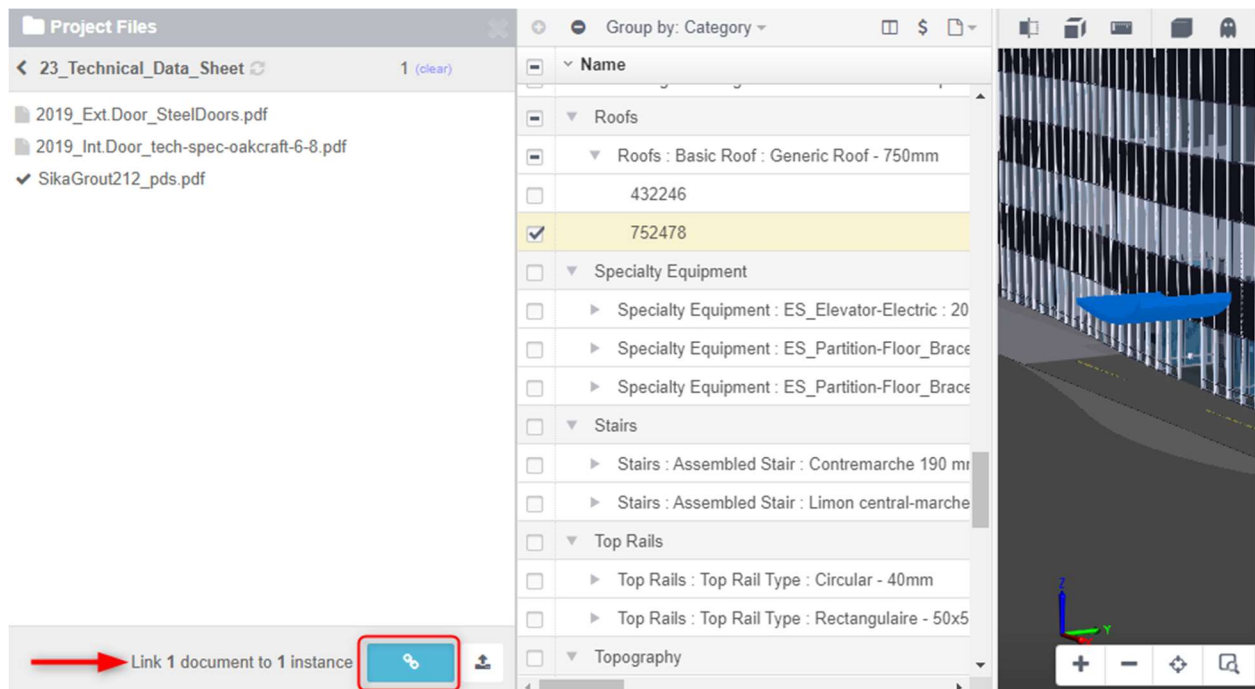

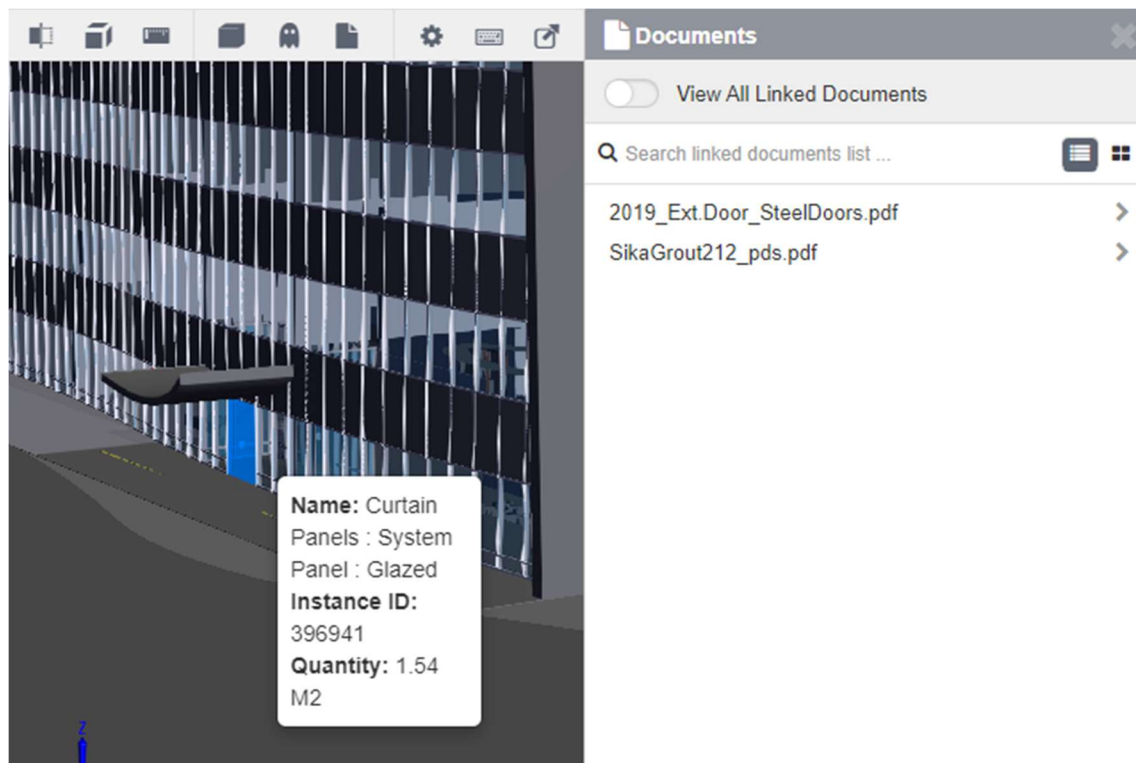Assemble tree structure   BIM 360 tree structure
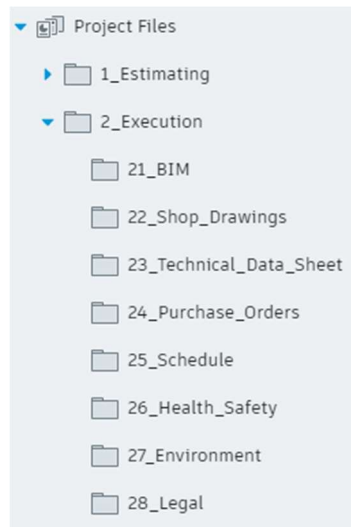
Then, you can select items in the view or the list and select the file you would like to link to the objects. Just click the link button at the bottom of the palette (circled in red in the next picture).

Item selection in Assemble

So now when you select an item, the corresponding document can be seen in a list on the right side.

Linked document view in Assemble

How to create Issues in Assemble
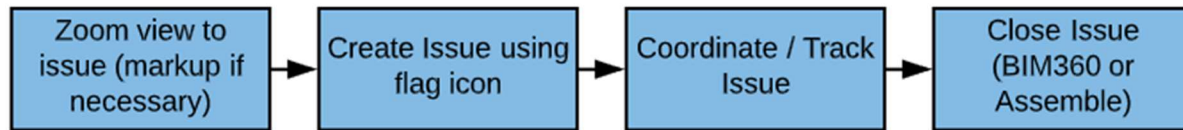
Issues in Assemble are directly linked to the ones in BIM 360 and the process of creating them is the same. To do so, click on the flag button on the right side of the screen.
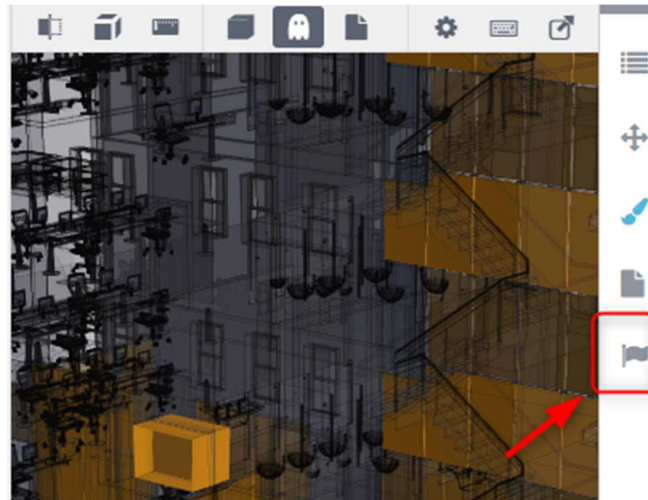
Issues in Assemble

Once the toolbar shows up, click on the [+] sign on the upper right section of that toolbar.
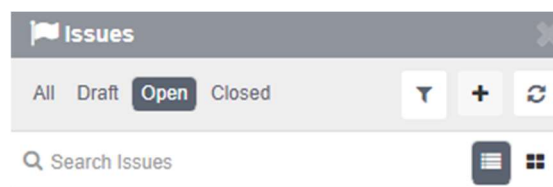
List of issues in Assemble

The rest is the same as in BIM 360. You type a subject, a description, a status and select an assignee. You can also add attachments by clicking on the camera button at the bottom.

Issues creation in Assemble

Once an issue is created, the list of issues is available with the flag button in the right tool palette. All issues created in Assemble are equally viewable in BIM 360 (Document and/or Field Management).

All issues created in BIM 360 are only available in BIM 360 and the same is true regarding the Assemble space. <u>This makes sense because you wouldn't want to see all BIM 360 issues that are not necessarily useful to the Assemble team.</u>

List of issues in Assemble

Issue card in BIM 360

List of issues in BIM 360

Organizing Data per Cost Codes

The views in Assemble provide any user, even those with limited BIM knowledge the power of filtering models into data sets where users see only the specific objects they need for budgeting.
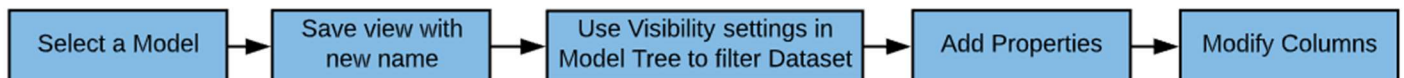
Creating Cost Codes Views

The first step is to begin saving views for the different cost codes that will form the construction budget; ie. 033000-Concrete Supply, 230000-Ventilation, etc…
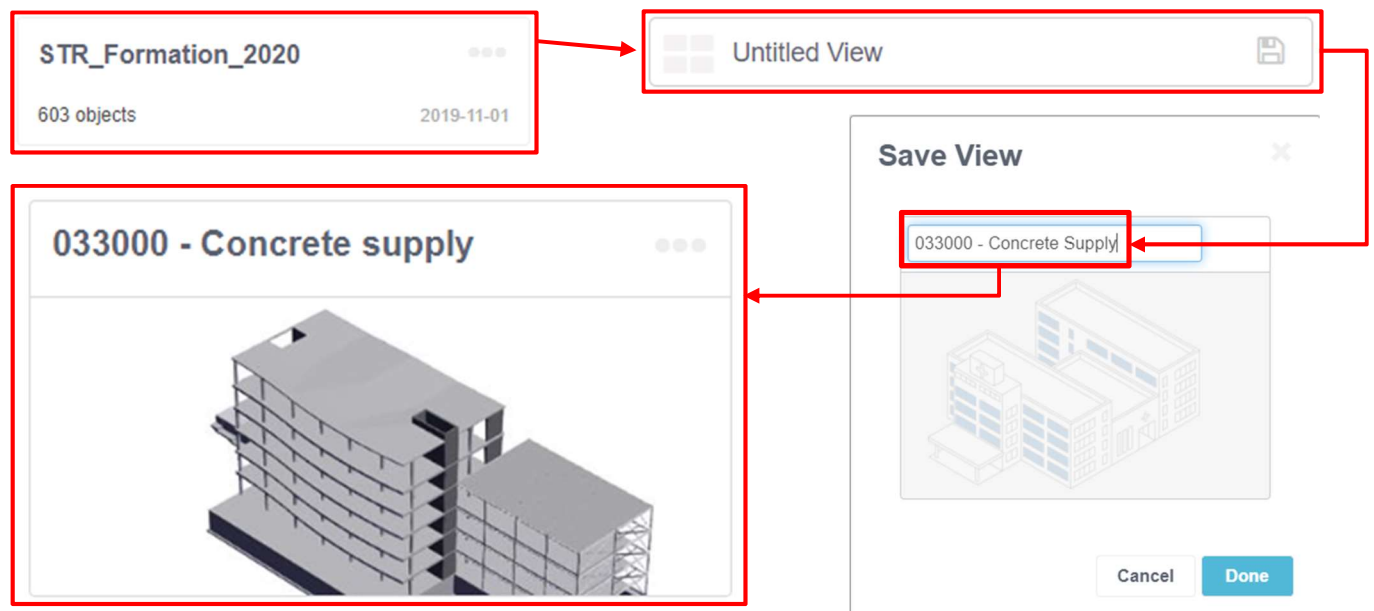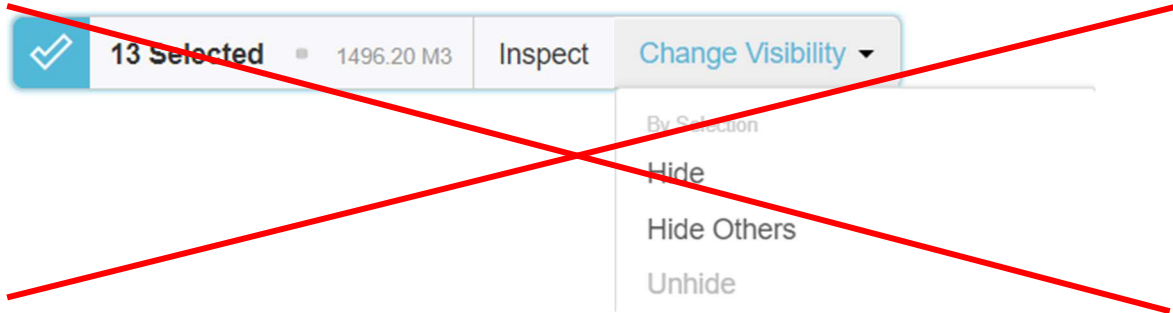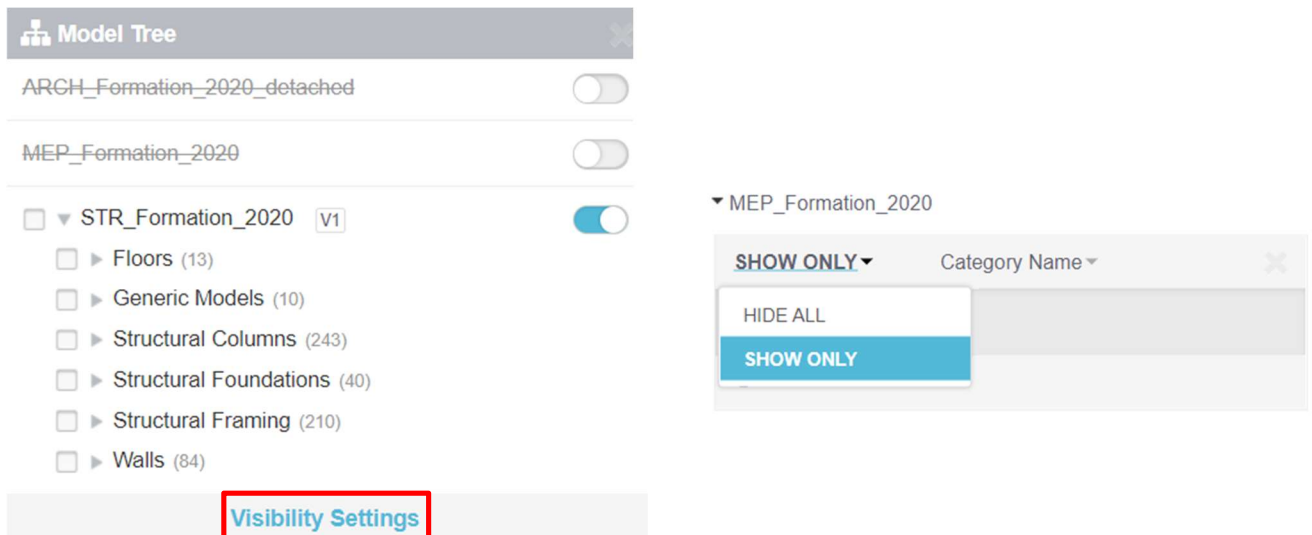

Cost Code Views

Intelligent Data sets

Within a view, use the model tree tab to isolate only the elements belonging to the specific cost code.

Hiding objects by direct selection is **not recommended** as this causes a static view that could not be changed.

Instead, the **Visibility Settings** is the recommended method of isolating data in the model. With this option it is still possible to **SHOW ONLY** objects in a saved view. The advantage is being able to revert changes or make adjustments (see ventilation example below).

Visibility Settings options

Finally, users can select the color by property (paint brush icon) to identify the objects in the model viewer.

The image below shows the different colors associated to ventilation objects in our example.
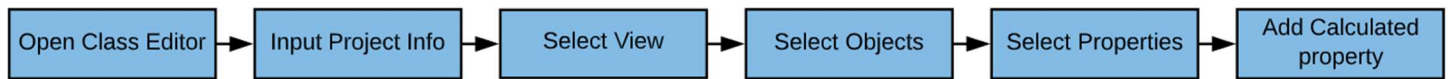
Color by Property
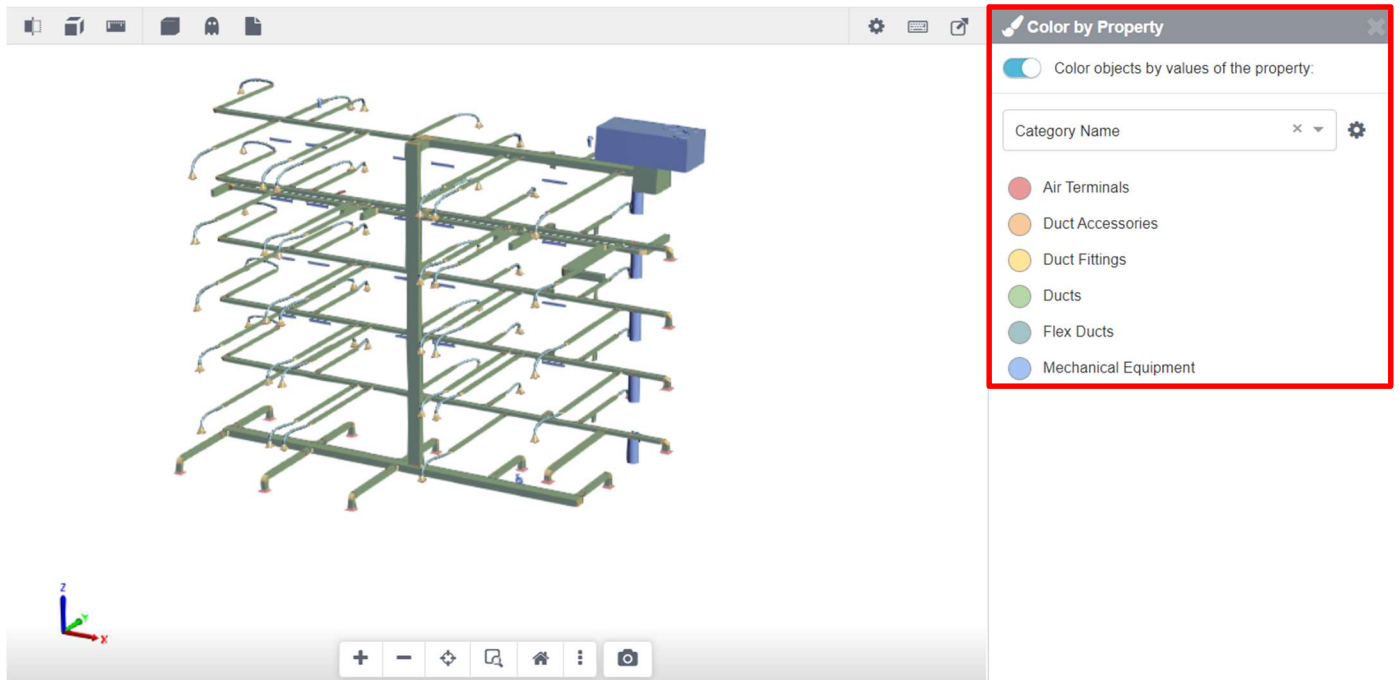
Visibility Settings example

Complete a Cost Estimate Analysis

Assemble has developed a few tools to facilitate the analysis of budgets, namely the Class Editor, PowerBI templates, and the Excel add-in. Here's the general workflow:

| Open any tools (Excel, PowerBI, Class Editor)	→	Manipulate Data	→	Report Data	→	Make Clear Decisions

Class Editor

Use the Class Editor to perform more powerful back end calculations. Make sure you copy the right URL and that you enter the correct password and click connect. This will allow you to access all your projects and specific views.

Open Class Editor	→	Input Project Info	→	Select View	→	Select Objects	→	Select Properties	→	Add Calculated property

Before jumping into the Class Editor with calculations, it is important to know your desired end result in order to create additional properties in Assemble if they don't already exist. For example, if I would like to calculate the waste factor for drywall it is necessary to create a new property, call it **Drywall Waste** to act as a place holder for this new "Calculated data". As mentioned before, navigate to the Edit Project tab to manage and create **Properties**.

Assemble Property Manager
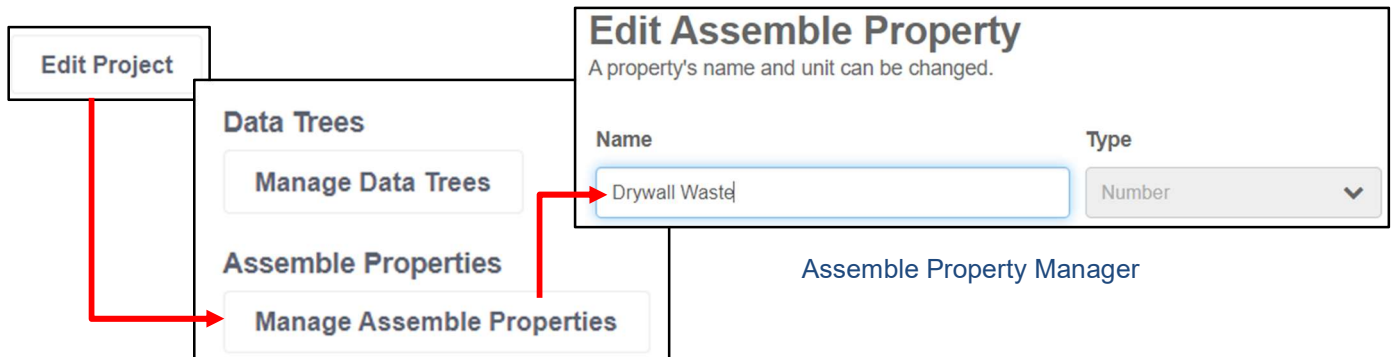
After all our parameters are set up, open the **Class Editor** and start the magic (screenshot on the right).
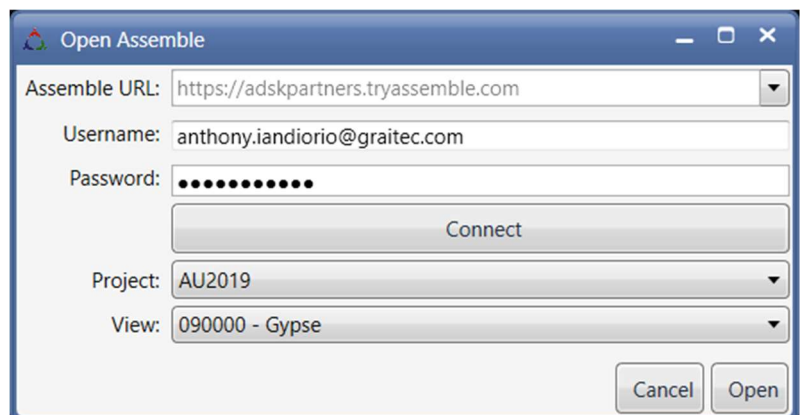
Opening Class Editor

First select a specific object (in the table or model space) and click on Properties.

Name	Value
⊟ Assemble	
Quantity	Area
Base Level	Niveau 6
Base Offset (M)	0
Top Level	Toit
Top Offset (M)	-0.23
⊟ Type	
Model Name	ARCH_Formation_20
Category	Walls
Family Name	Basic Wall
Function	Interior
Type Mark	C2
Type Name	Generic - 150mm
Wrapping at Ends	None
Wrapping at Inserts	Do not wrap
⊟ Numeric	
Absorptance	0.10
Area (M2)	29.55

Adjusted Drywall Area for 20% waste

Add a Calculated Property using the and select the property created (Drywall Waste). For this simple example, the interior walls are still generic models which means Revit returns a single-sided surface area (currently no drywall composition modeled) so we must multiply by two (2) as there are two sides to the wall. In our calculation let's assume a 20% waste factor; and voila, we get the result of 71m^2.

If uncertain, we recommend doing a test calculation on a simple wall as we just did. The last step consists of creating a filter in order to apply the calculation to all identical instances (final results in table below).

	Name	Quantity	Unit	Model Name	Count (EA)	Area (M2)	Drywall Waste
● ▼	Walls	3,578.87	M2	ARCH_Forma...	330		
● ▶	Walls : Basic Wall : Generic - 100mm	1,134.76	M2	ARCH_Forma...	161	1,134.76	2,802.00
● ▶	Walls : Basic Wall : Generic - 150mm	2,444.11	M2	ARCH_Forma...	169	2,444.11	5,959.00

Adjusted Drywall Area for all objects

Awesome Visualization with Power BI

Present high-level numbers to superiors for clear decision making by using the PowerBI template.

Once the Power BI template is opened, enter the domain that is assigned to your company. Do not type the whole domain, only the portion before ".tryassemble.com"; in this case **adskpartners**. From there, select Edit, filter a specific project and the Assemble Power BI template does all the heavy lifting, all you need to do is filter data. We suggest going through the filters, you just might find some empty data sets that may require correction.

Power BI AU2019 main page

Link to Excel

If your company has already created standard Excel templates for budget reporting, use the Assemble add-in to map model quantities to specific cells in your spreadsheet.
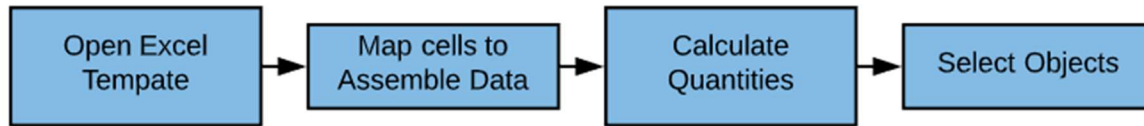
Make sure you have the right model mapped when updating models. In other words, *don't use the ARCH model to update structural elements*; Assemble will return 0 because it will not locate the right data. Otherwise it is always possible to update based on a specific View.

Assemble Report Connection

URL:
https://adskpartners.tryassemble.com

User Name:
anthony.iandiorio@graitec.com

Password:
•••••••••••

Project
AU2019

○ View ● Model

ARCH_Formation_2020_detached

Version
50%

Assemble Report Connection

URL:
https://adskpartners.tryassemble.com/

User Name:
anthony.iandiorio@graitec.com

Password:
•••••••••••

Project
AU2019

● View ○ Model

033000 - Concrete supply

Version
N/A

View   Cancel   OK

Map Quantity

Quantity Property:
Count

Filter Property:
Family Name

Filter Values:
- M_Cuvette réservoir-3D
- M_Pompe - A fixation par base plane
- M_Réduction - PVC - Nom. 40 - DWV
- M_Robinet à tournant - PVC - Nom. 40 - D
- M_Roof Drain
- M_Rooftop AC Units - Gas Fired - 97-176
- M_Té - Soudé - Générique
- M_Transformation - Soudé - Générique
- M_Tub-Rectangular-3D
- M_Urinoir - Mural
- M_Vanne d'isolement - 10-40 mm
- M_WC - A réservoir mural
- Pipe Types
- Rectangular Duct
- Rectangular Elbow Eccentric Radius - D
- Rectangular Endcap

Add

Filters

Property Name	Property Value
Family Name	M_Tub-Rectangular-3D

Delete Selected

Cancel   Save

You can tell which cells are mapped to Assemble data by the red tick at the corner of a cell; hovering over will display the mapping path.

AU2019
Projet 19001
220000 - Plumbing Direct Costs

Div.		Qty	Unit	Unit Price
22 00 00 - PLUMBING				
22.01	Plumbing			sous-total
	Plumbing piping		l.m.	20.00 $
	Drain piping		l.m.	15.00 $
	Hot water tanks		units	300.00 $
	Toilette bowls		units	300.00 $
	Urinals			
	Bath tubs			

{"QuantityPropertyId":"Count","Filters":[{"FilterPropertyId":"FamilyName","FilterValues":["M_Tub-

After all cells are mapped and the **Calculate Quantities** button is executed the values are filled into their respectful locations. In this Excel sheet, the quantity values from Excel are multiplied by the unit costs to get the **Sub-Total**.

AU2019
Projet 19001
220000 - Plumbing Direct Costs

Div.		Qty	Unit	Unit Price	Total	Sub-Total
22 00 00 - PLUMBING						40,460.73 $
22.01	Plumbing			sous-total		40,460.73 $
	Plumbing piping	1,588	l.m.	20.00 $	31,764.96 $	
	Drain piping	580	l.m.	15.00 $	8,695.76 $	
	Hot water tanks	5	units	300.00 $	1,500.00 $	
	Toilette bowls	3	units	300.00 $	900.00 $	
	Urinals	3	units	300.00 $	900.00 $	
	Bath tubs	11	units	300.00 $	3,300.00 $	

Here is another example using the concrete supply division.

AU2019
Projet 19001
030000 - Concrete Direct Costs

Div.			AssembleConnection			

Div.		Qty	Unit	Unit Price	Total	Sub-Total
03 00 00 - CONCRETE						3,208,960.51 $
3.01	Structural Framing			sous-total		3,208,960.51 $
	Concrete footings volume	73	m3	200.00 $	14,548.42 $	
	Concrete walls volume	438	m3	200.00 $	87,644.45 $	
	Concrete columns volume	132	m3	200.00 $	26,428.78 $	
	Concrete slabs volume	1,496	m3	200.00 $	299,239.75 $	
	Approximate total Rebar	1,391	MT	1,500.00 $	2,085,824.33 $	
	Approximate Rebar labor	1,391	MT	500.00 $	695,274.78 $	

Updating model data using the Reports portion in the Assemble add-in. You will notice that the workflow below is exactly as the tabs found in the Assemble add-in

The image above shows the set up in Excel where the values for the properties are null. As you can see below, once the values for **Unit Cost** and **Zone/Area** are entered in Excel; the Update Assemble button automatically populates the data fields in the model. As such, for the unit cost is applied to the total quantities and the **Total Cost** is calculated.

Name	Quantity	Unit	Model Name	Count (EA)	Height (M)	Thickness (M)	Unit Cost	Total Cost	Zone/Area
˅ Windows	108	EA	ARCH_Format...	108			💬	22,400.00	
▸ Windows : FE_Fixed : 0610 x 1880mm	55	EA	ARCH_Format...	55	103.40		200.00	11,000.00	Hotel
▸ Windows : FE_Guillotine : 760 x 1565 mm	45	EA	ARCH_Format...	45	70.42		200.00	9,000.00	Office
▸ Windows : FE_Imposte : 1830 x 0610 mm	8	EA	ARCH_Format...	8	4.88		300.00	2,400.00	Hotel

Conclusion

To recap, we covered the key workflows in setting up an Assemble project and linking it to a BIM360 account in order to preserve a single source of truth while finally delving deeper into best practices for view creation per cost code. Finally, we closed with the tools developed by Assemble that are specific to preconstruction analysis.

We hope that this handout will serve its purpose as your personal memory aid so feel free to print a copy for your desk, or if you're environmentally conscious as we are keeping the pdf handy in an easy to find location.

Best of luck on all your projects!