

Pointfuse V4.4 Quick Start Guide

Pointfuse quickly and accurately converts point clouds into intelligent mesh models. Use the Pointfuse wizard to classify surfaces, including IFC for BIM. You can directly upload some or all classified surfaces to Autodesk BIM 360 or export to multiple formats to continue your workflow.

Pointfuse runs on a physical PC.

With a full (purchased) license, you can also run it on a virtual machine.

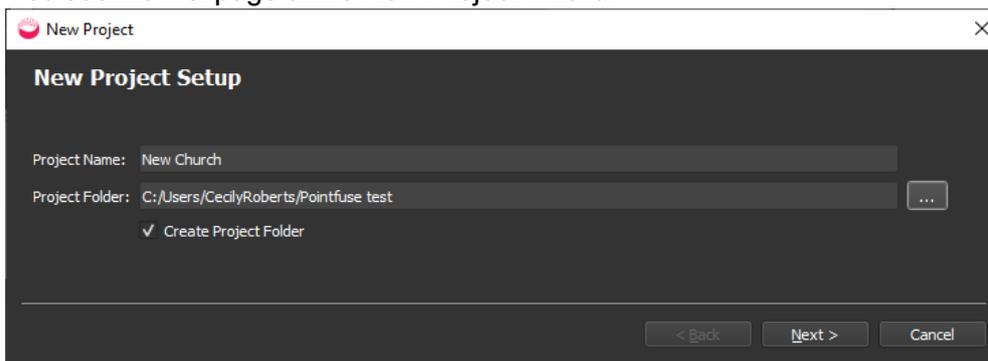
With a Trial license, you must disable Hyper-V and Windows Sandbox, which use virtual machines.

You **can** use Pointfuse via desktop sharing, but Remote Desktop is **not** supported. TeamViewer is the suggested alternative.

The User Guide includes a Quick Start section, which is more detailed than this short Quick Start Guide.

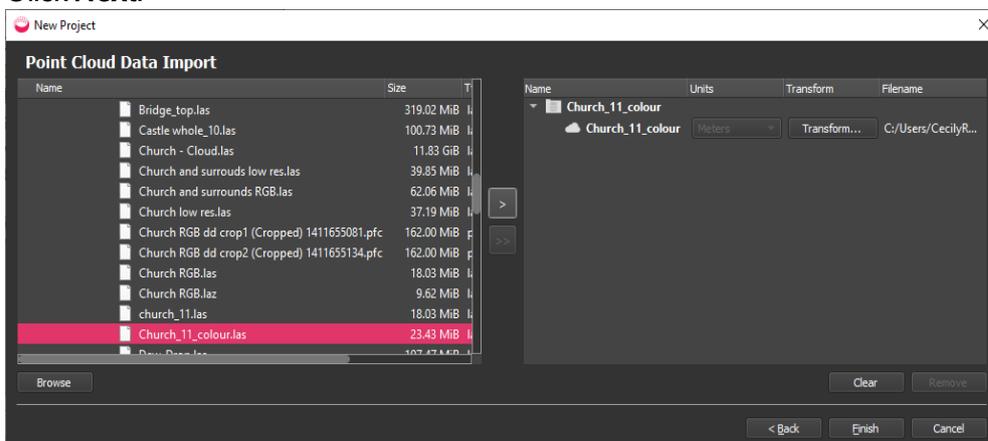
Load a Point Cloud

1. Download and open Pointfuse.
2. In Windows Explorer, navigate to a point cloud, and drag and drop it into Pointfuse. You see the first page of the New Project wizard.



Optional: Specify a custom **Project Name** and **Project Folder**.

3. Click **Next**.



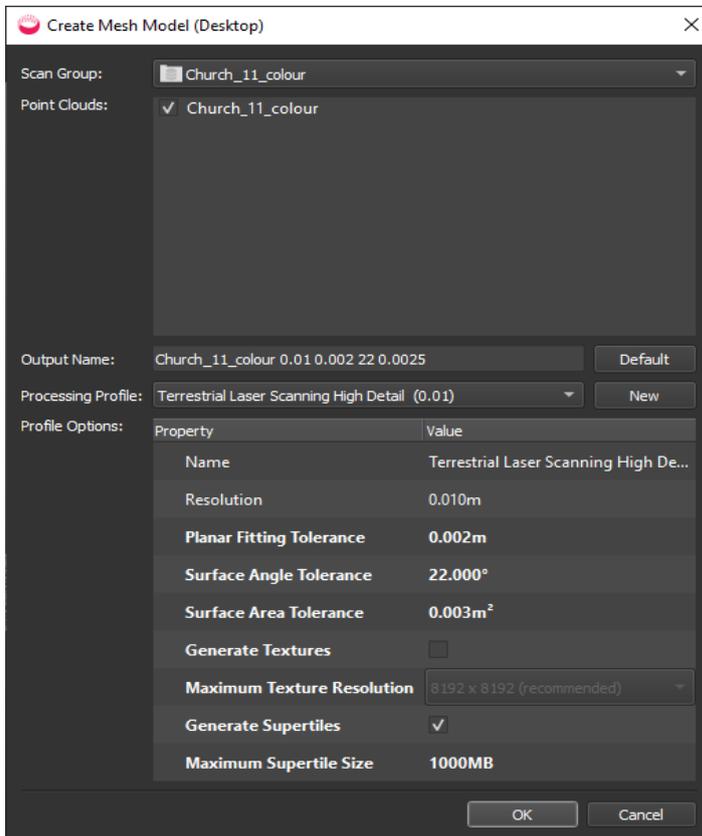
4. Click **Finish**. The point cloud will be imported and then displayed in the viewport.

Optional: If you want an intelligent mesh model created from only part of the point cloud:

- Use the **Crop** tool  to create a new, smaller point cloud.
- Select the new, cropped point cloud in the Project Explorer (no need to display it).

Create an Intelligent Mesh Model

1. Click **Create Mesh Model**  and select **Desktop** .



Optional:

- Specify a custom **Output Name**.
 - Select a different **Processing Profile** with different **Resolution** and **Tolerances**.
 - If the point cloud has RGB or intensity data, you can select **Generate Textures** and a **Maximum Texture Resolution**. This may increase processing time
 - Change **Supertile** parameters.
2. Click **OK** to create the mesh model. The mesh model is displayed when finished.

Scan to BIM Workflow

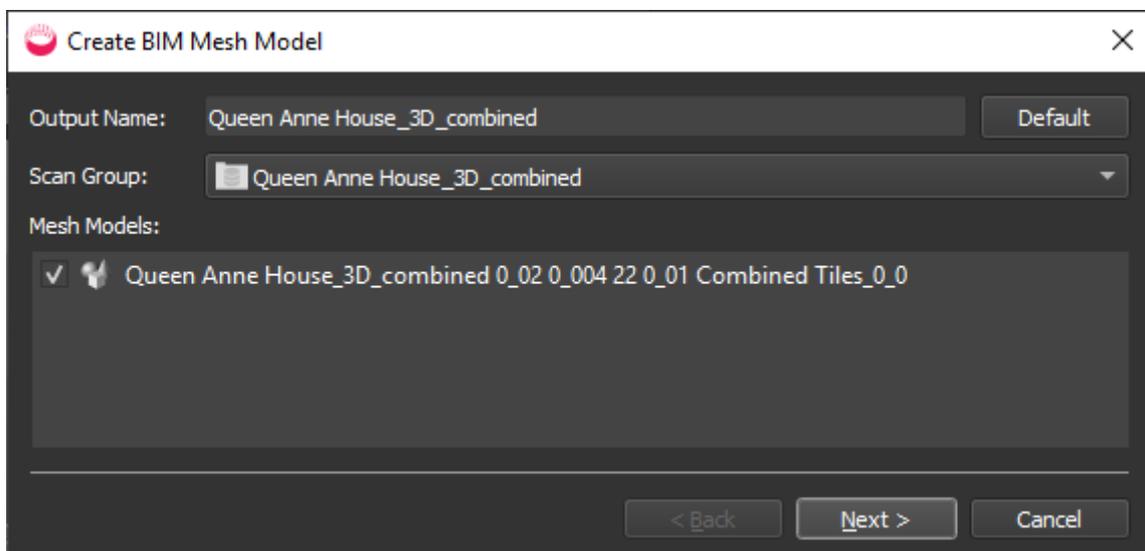
1. Display mesh model.
2. Optionally crop to create a copy, and crop away any irrelevant areas.

3. **Create BIM Mesh Model** .
 - a. Add stories for each level of the building.
 - b. Select a classification template for each story.
4. **Classify BIM mesh model** to select surfaces and create at least one story with some classified walls.
5. **Create BIM Model** with floor plans for each story .
6. **Edit BIM model**. For example, combine walls and make them square; split and delete walls; add walls, partitions, doors, and windows; change dimension and position of doors and windows; equalize wall heights, fit floor slabs (to create rooms), and change the elevation.
7. **Create Floor Plans** of the 3D model and **Create Report** of the site (stories, rooms, area etc).
8. **Export BIM mesh model as IFC**.
9. Open IFC export in Revit.

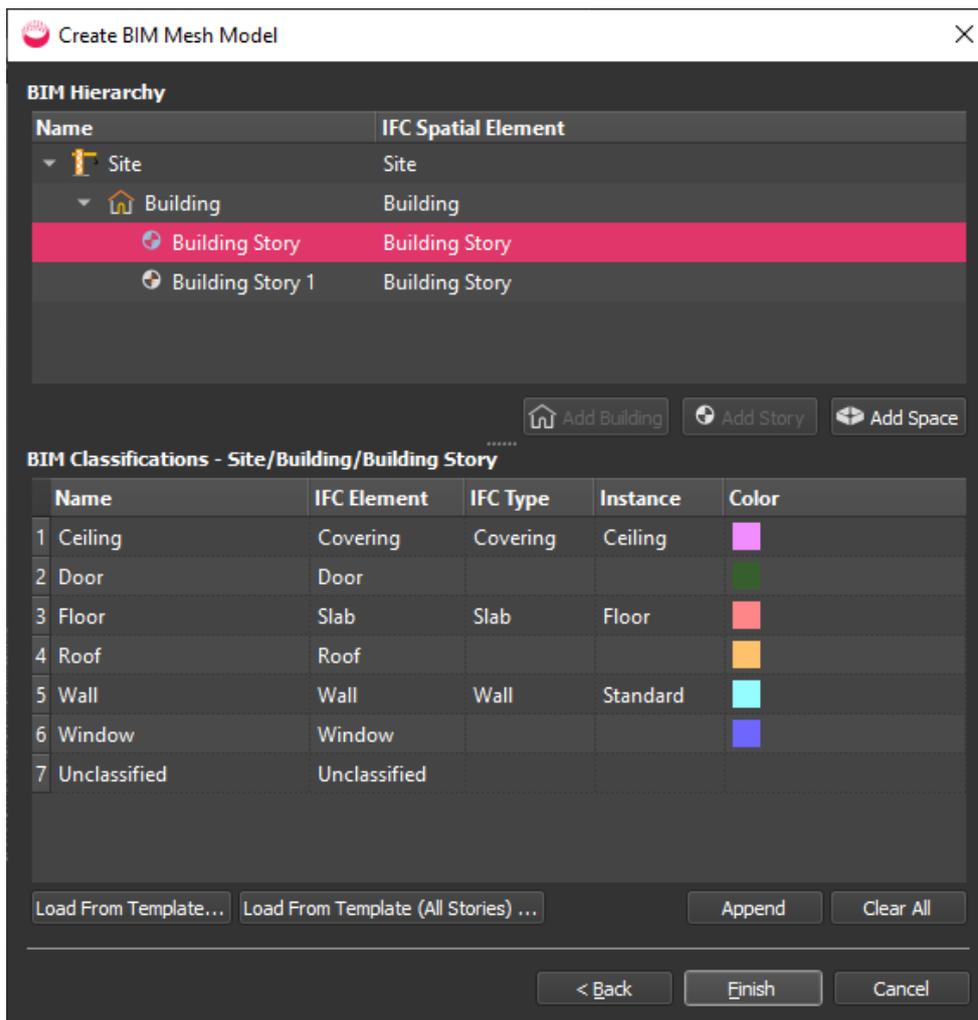
Create BIM Mesh Model

Use to apply IFC or other classifications to surfaces in the mesh model. Create and edit templates and map custom fields, for example to IFC to ensure inter-operability in the next stage of your workflow.

1. Click **Create BIM Mesh Model**  to open the wizard:



2. Click **Next**:

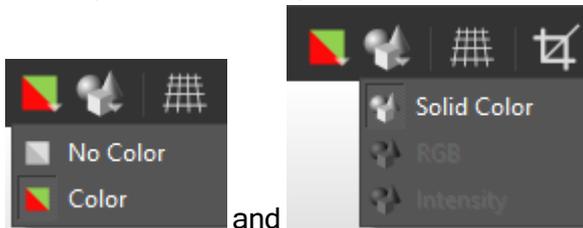


3. Create the site hierarchy, with one story for each different floor elevation. For example, click a Building and select **Add Story**.
4. To choose a different classification template, select a story and then select **Load from Template**. If you have multiple stories, you can select **Load from Template (All Stories)**. In the Template Selector dialog, select a template, optionally edit it, and click **OK** to return to the main wizard.
5. In the main wizard, you can edit the BIM classifications.
6. Click **Finish**.
7. Click **File > Save All**.

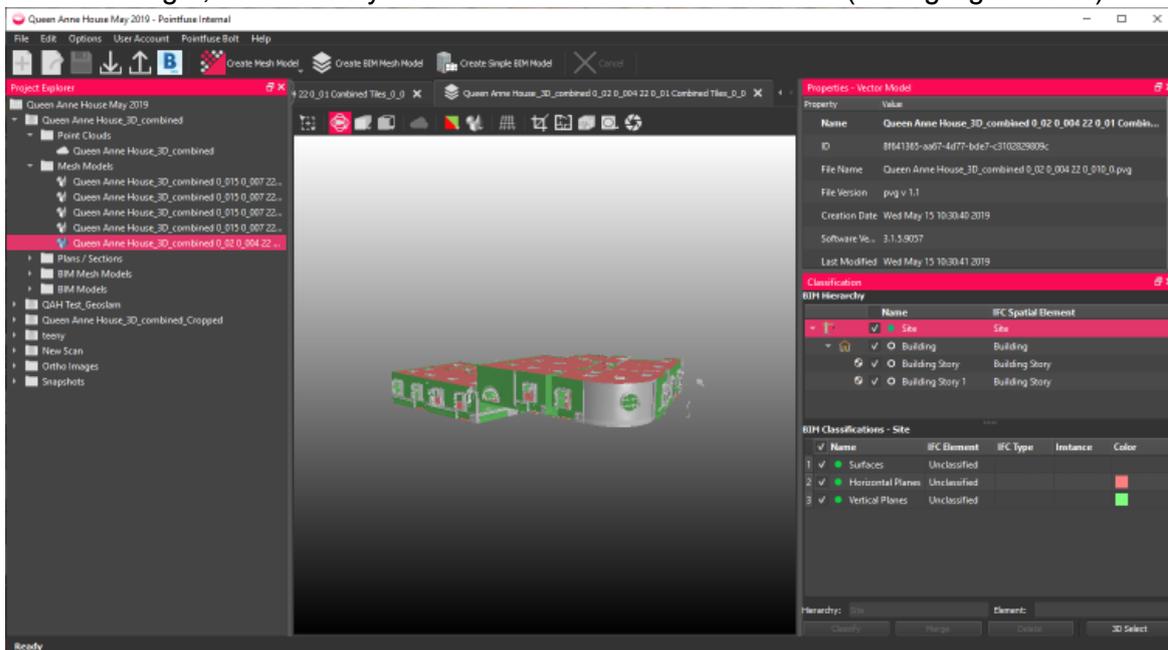
Classify BIM Mesh Model

You must classify walls to associate each with its building story before you can create a BIM model.

1. To display the model, in Project Explorer, open the BIM Mesh Models folder and double click the model.
2. To see classifications clearly, select **Color** for classifications, and if the model has RGB or intensity texture, switch them off, and select **Solid Color**:



3. The model is color-coded by auto planar classification, as indicated in the Classification window in the bottom right, which initially shows the classifications for the Site (the highlighted row):



4. Select one or more mesh model surfaces to classify as a specific IFC element in a specific story. Use a combination of 3D selection and manually selecting individual surfaces or groups of surfaces:
 - Select multiple IFC elements: Click **3D Select** to use a cropping-style box, or **Ctrl+Click** on each surface in turn, or press and hold **Ctrl** to drag select.
 - Select a single surface: single click.
5. In the Classification window, click on the **Story** and **IFC Element**:

Classification x

BIM Hierarchy

	Name	IFC Spatial Element
✓	Site	Site
✓	Building	Building
✓	Building Story	Building Story
✓	Building Story 1	Building Story

BIM Classifications - Site/Building/Building Story 1

	Name	IFC Element	IFC Type	Instance	Color
1	○ Ceiling	Covering	Covering	Ceiling	■
2	○ Door	Door			■
3	○ Floor	Slab	Slab	Floor	■
4	○ Roof	Roof			■
5	○ Wall	Wall	Wall	Standard	■
6	○ Window	Window			■
7	○ Unclassified	Unclassified			

Hierarchy: Site/Building/Building Story 1 Element: Ceiling

Classify Merge Delete 3D Select

- Click **Classify** to classify them, but retaining separate surfaces, or **Merge**, to merge and classify them.
- To hide an IFC Element from view, uncheck it:

BIM Classifications - Site/Building/Building Story 1

	Name	IFC Element	IFC Type	Instance	Color
1	☐ Ceiling	Covering	Covering	Ceiling	■
2	✓ Door	Door			■

You can also right click on the selected row and, from the context menu, select to show, hide or toggle that element from all levels.

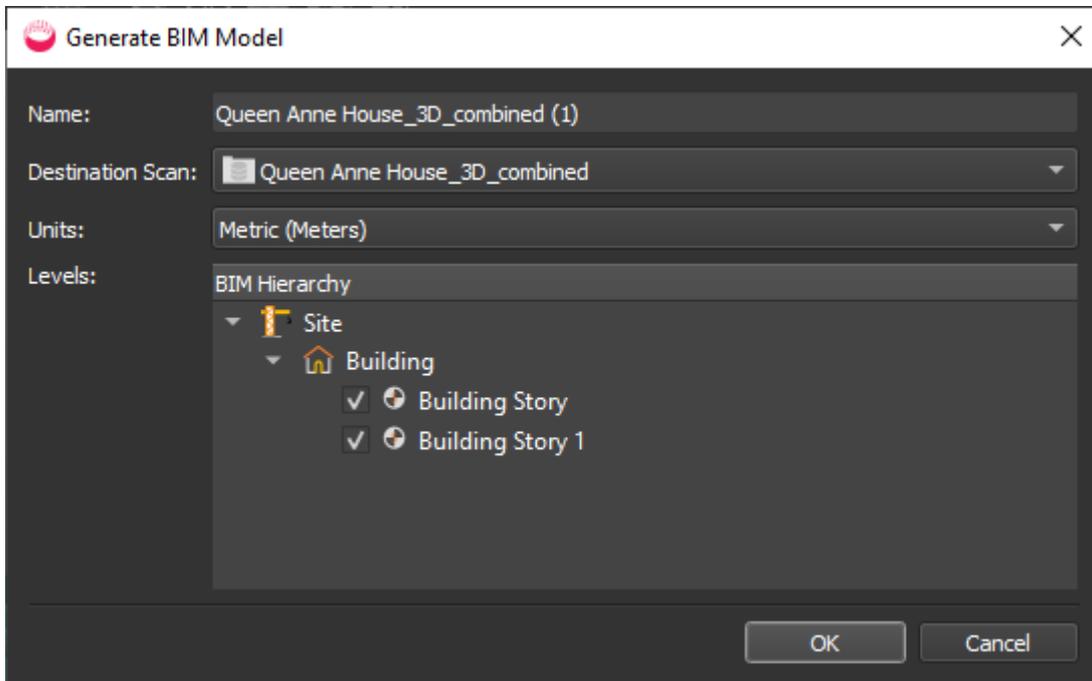
- Repeat until you have classified all surfaces.
- Click **File > Save All**.

Create BIM Model

Before you can create a BIM model, you must have classified the walls of the BIM mesh model to associate each with its building story.

Create and edit floor plans for each story to refine the model before exporting for the next stage of your workflow: for example, in IFC format for Revit.

1. Click **Create BIM Models** :

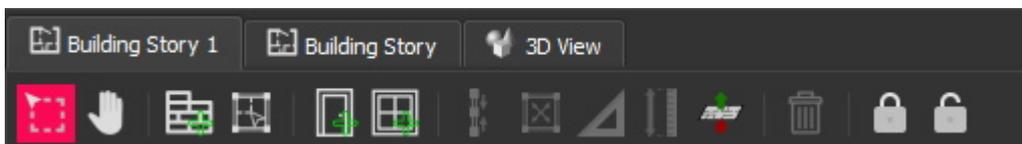


2. After a few seconds, you see a floor plan of one story, with tabs for other stories, one for 3D preview, and a toolbar below. These tools are for editing the BIM models by editing the floor plans.

Edit BIM Models

When you open a BIM model in the viewport, there are tabs for each 2D story, with a toolbar and context menu, and another tab for the 3D model. Edits you make to one are immediately applied to the other, but you do most editing in 2D.

Edit Building Stories



In a 2D view, switch between **Select**  and **Pan** .

Use the tools to refine the BIM model: combine walls and make them square; split walls; add and delete walls, partitions, doors, windows; equalize wall heights, and fit and delete floor slabs (to define rooms, for example).

Edit Walls

Lock and Unlock Walls

In a 2D view, you can select one or multiple walls and **Lock**  them so you they are unaffected by changes you make to surrounding walls.

Locked walls have black nodes and are shaded grey: .

Select and click **Unlock**  to enable editing.

Move End Nodes

You can move the start and end points of a wall by selecting and dragging the nodes at either end.

Where the nodes of two or more elements are at the same point, they are pink; if they are just near, they are gray. To connect existing nodes, roll the mouse wheel to zoom in, then click and drag one of them until it overlays the other:



You can then **Combine**, **Make Square**, or just drag the shared node.

Nudge Wall Position

By default, nodes are at the center of each end. When you select a single wall, you see clickable triangles to cycle through nudging walls in, out, or centered. You can also press **Spacebar**.



Change Wall Width

Hover over a wall edge and when you see a pinky-orange highlight, drag the edge. Whether the wall widens or narrows in one direction or both depends on whether the nodes are centered or on corners (whether the wall has been nudged).



Split Wall

Just double click where you want to create new, overlapping nodes.

Combine or Join Walls

1. To combine walls, they must have a node in common (indicated pink):



2. Click one wall and **Ctrl+Click** the other:



3. Click **Combine Walls**  :



Where the ends of two walls are close, but **not** joined, select both, then right click anywhere in a floor plan and select **Extend and Join**.

Show Intersection Angles

To display the angles of wall intersections, right click anywhere in a floor plan and check **Show Intersection Angles**.

Make Square

1. To align contiguous walls that are nearly at right angles, as right angles, select with **Ctrl+Click**.
2. Click **Make Square** .

Add Wall or Partition

Partitions create boundaries for floor slabs where there are no walls. Partitions are not visible in the 3D view.

1. In a 2D view, click **Add Wall**  or **Add Partition** .
2. In a 2D view, left click once for the start point, again for the end point of that wall or partition - which will also be the start point of the next wall or partition.
3. Press **Esc** to stop adding walls or partitions.

Add Door or Window

1. In a 2D view, click **Add Door**  or **Add Window** . (There are equivalent tools on the 3D view toolbar.)
2. Click once on a wall or partition at the center point of the door or window.
3. **Doors** are red and **windows** are green:



4. Slide the position by dragging from the center node, or change the width by dragging the nodes at either end.

Fit Floor Slabs/Identify Rooms

A floor slab must be fully enclosed by walls and/or partitions. The floor area is indicated by shading and the walls are nudged outwards so the nodes intersect at the inside corners.

Fit (single) Floor Slab

1. In a 2D view, **Ctrl+Click** the walls and partitions that enclose the floor slab you want to define - and no others: **all selected wall notes must be pink**. See the User Guide for examples.
2. Click **Fit Floor Slab** .
3. You can select individual walls and click the nudging triangles to nudge to a different position.

Identify Rooms

This will try to fit floor slabs in **all** areas of the story that are enclosed by walls/partitions.

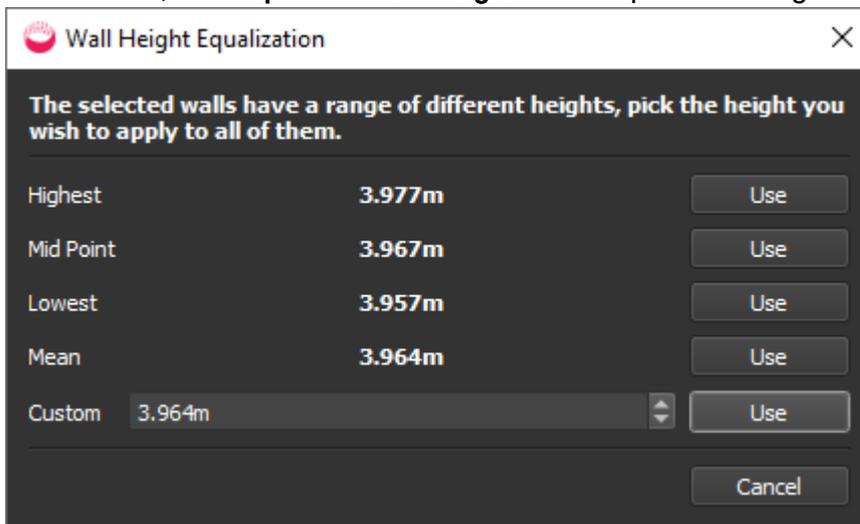
1. Right click anywhere in a floor plan and select **Identify Rooms**.
2. Where slabs are not created, check for gaps in walls/partitions (gray nodes instead of pink), connect them, and rerun **Identify Rooms**.
See the User Guide for details of other cases where a slab may not be fitted, for example, where there is a room within another room **and** connected by a single wall.
3. Delete any unwanted floor slabs, and nudge or adjust wall positions if necessary.

Change Properties of IFC Elements

1. In a 2D view, select a wall, door, window etc.
2. In the **Properties** window, change the values for **Width, Height, Thickness, Elevation** etc.

Equalize Wall Heights

1. In a 2D view, click **Equalize Wall Heights**  to open the dialog:



2. Choose a height for the selected walls and click **Use**.

Set Story Elevation

1. In a 2D view, right click to see the context menu and select **Set Story Elevation** . (There is an equivalent tool on the 3D view toolbar.)
2. In the dialog, change the current value and click **OK**.

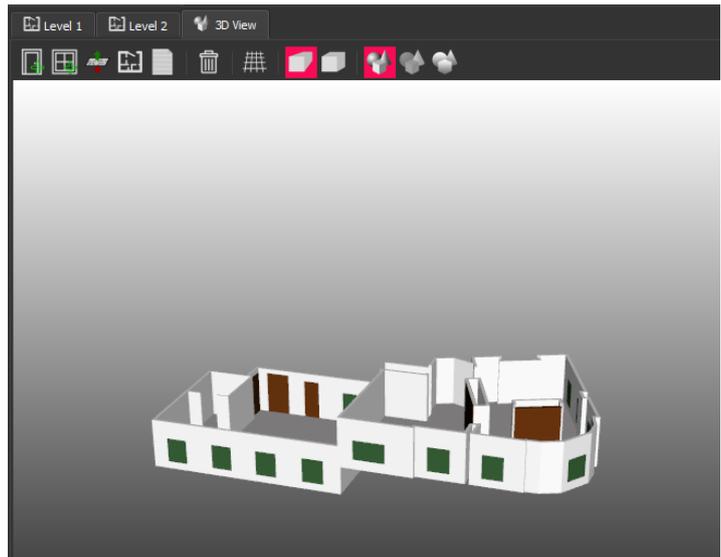
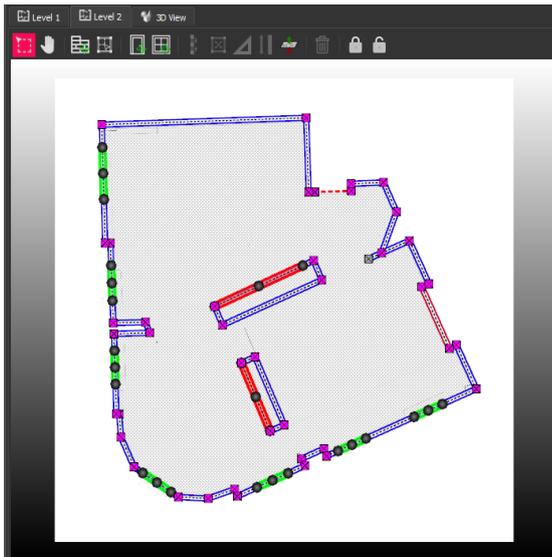
Remove (Delete)

1. In a 2D view, **Click** (single element) or **Ctrl+Click** (multiple elements).
2. Click **Remove** .

Editing 3D Models

To check your work, compare the 2D floor plan of each story with the 3D view of the whole site.

Partitions are not visible in the 3D view.



Add Door or Window

1. In the 3D view, click **Add Door**  or **Add Window** .
2. Click once on a wall at the center point of the door or window.
3. **Doors** are brown and **windows** are green.
4. To edit a door or window's dimensions or position, go to the 2D view for the story.

Set Story Elevation

1. In the 3D view, click **Set Story Elevation** .
2. In the dialog, select one of the stories and click **OK**.
3. In the viewport, adjust the position of the selection box corners to set the lower and upper bounds of the story, then click **OK**.

Creating Floor Plans and Reports

To export a model, see "Export Mesh Model" on the next page.

Create DXF Floor Plan of a Story

1. In the 3D view, click **Create Floor Plan** .
2. A dialog is displayed. Select a story and click **OK**.
3. In the viewport, adjust the position of the selection box corners and height of the plane for creating the plan and click **OK**.
4. Choose a file location and name and click **Save**.

Create PDF or HTML Report of Model

You can create a report. It summarizes the number of levels, rooms, doors, and windows, as well as the total room area for the site. It has a floor plan for each story, and states the room, door, window and area totals for each.

1. In the 3D view, click **Create Report**.
2. Choose a file location, name, file type, and click **Save**.
3. Open the report.

Export Mesh Model

It is quick and easy to export whole mesh models or selected surfaces for the next stage of your workflow, in Autodesk, Teckla Structures, Revit, or ArchiCAD, for example.

The Trial version of Pointfuse limits you to exporting three mesh models, whether to Autodesk BIM 360 or files on your PC. After that, you need to buy a Full license to use Pointfuse.

The dialogs vary according to what you are exporting and how.

Export to Autodesk BIM 360

If you've selected and classified surfaces, the classification hierarchy will be uploaded with the model.

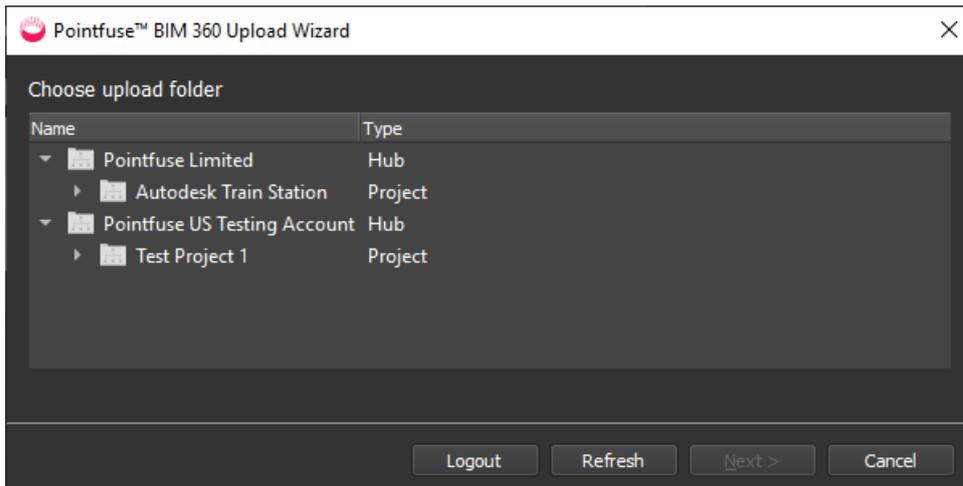
The dialogs vary according to what you are exporting.

Prerequisites

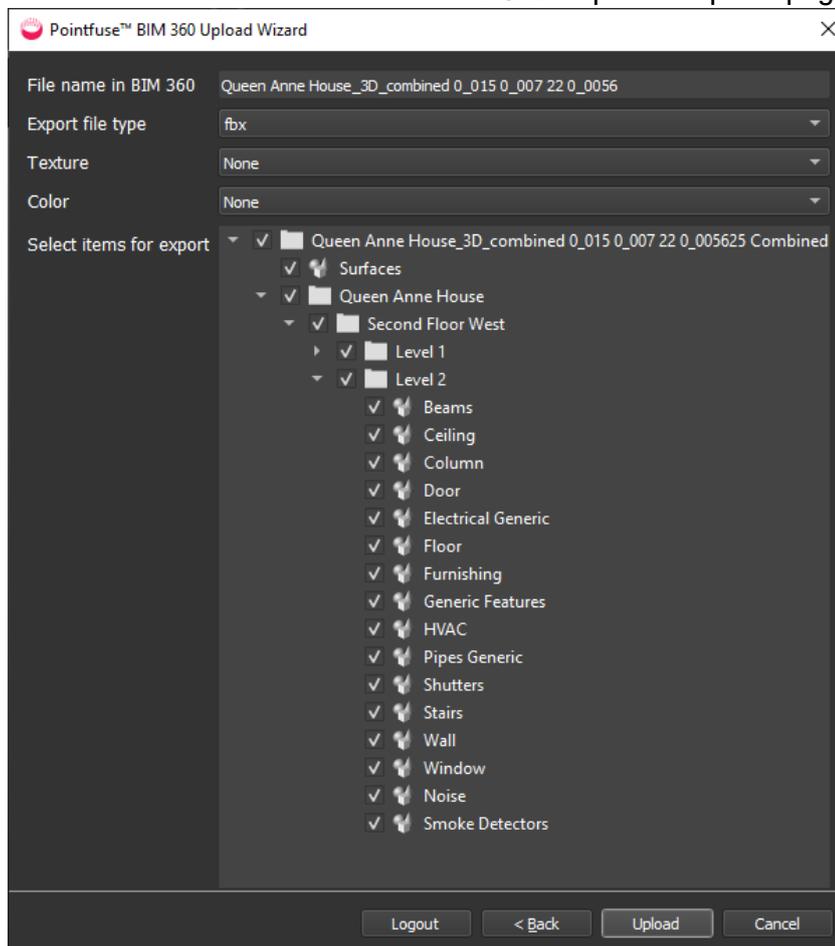
- An Autodesk BIM 360 account with admin rights. Add Pointfuse as an app, as explained in the Autodesk article [To Add Apps & Integrations](#).
- A full Pointfuse license or Pointfuse trial with at least one of the three exports remaining.

Export Single Mesh Model to BIM 360

1. Before exporting, click **Save**  on the toolbar.
2. To upload the whole model, or selected surfaces, select **BIM 360 Export** , and sign in to your Autodesk account and Project Files Folders.

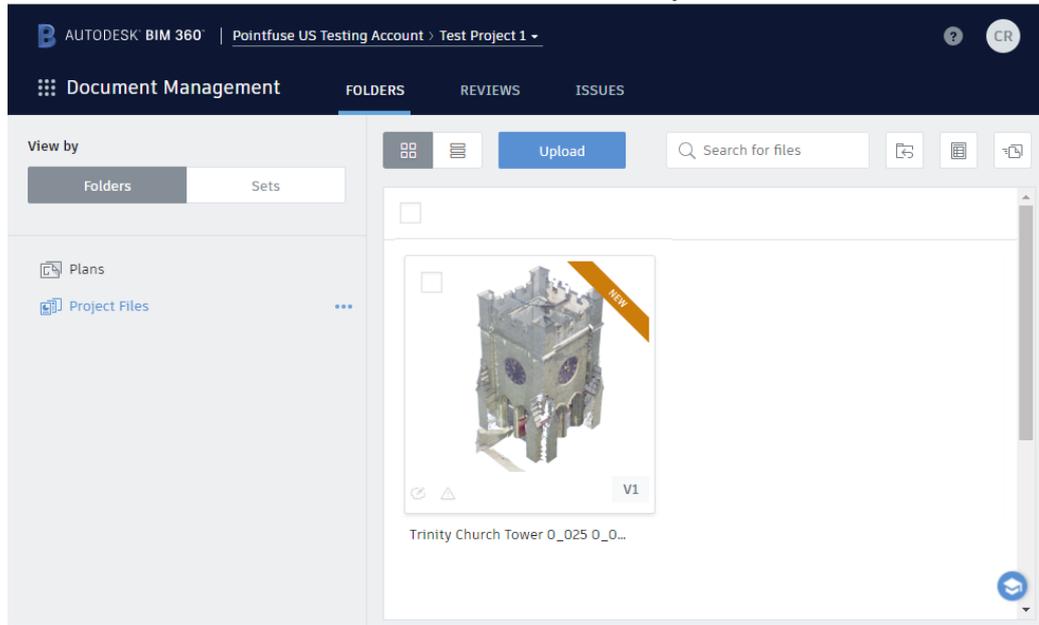


- a. Select the destination folder and click **Next** to open the upload page.



- b. Select the **File name**, the **Export file type**, and for FBX, whether to include a **Texture** or **Color**.
- c. By default, all groups and layers are checked. Uncheck any you don't want in the export.
- d. Click **Next** to upload the model.

- e. When done, select **Show file in BIM 360** to view it in your default browser.



- f. In the browser, functions include: preview (including markup), download, move, copy, rename, lock, share, and delete.

Export Single BIM Mesh Model to BIM 360

This is essentially the same as for a mesh model, but the lower part of the dialog where you select items has additional fields relating to the BIM classifications. Check and uncheck BIM Hierarchy stories and BIM Classification elements to determine exactly what will be exported.

Export to Files on Your Computer

The Trial version of Pointfuse limits you to exporting three mesh models, whether to Autodesk BIM 360 or files on your PC. After that, you need to buy a Full license to use Pointfuse.

The dialogs vary according to what you are exporting.

Export Single Mesh Model

1. Click **Save**  on the toolbar.
2. Display the mesh model in the viewport, select **Export** .
3. In the dialog, choose a **File Name** and click the Browse button to select an export format: DAE, DXF, FBX, IFC, NWC, OBJ, SKP, STEP, STL, or X3D.
 - If you've selected and classified surfaces, FBX and IFC retain the classification hierarchy.
 - If exporting to OBJ, DAE or FBX, you can include RGB or intensity texture in the export.

- For single (not batch) you can choose whether to export the whole model or selected groups and layers.
4. Click **OK** to create the export files. You can open them in a CAD or similar program, but not in Pointfuse.

Export Single BIM Mesh Model

This is essentially the same as for a mesh model, but the lower part of the dialog has additional fields relating to the BIM classifications. Check and uncheck BIM Hierarchy stories and BIM Classification elements to determine exactly what will be exported.

Batch Export

If you have a **Full** license, you can export multiple files of the same type, but you can't select which surfaces and layers to include. Select the models in the Project Explorer, right click, and select **Batch Export**.

Import IFC to Revit

1. Open a new or blank Revit project.
2. Open the IFC file in the project.
3. In Windows Explorer, navigate to the folder containing the IFC file.
4. You can open this .RVT file in Revit in the normal way.