Bonsai

for

DUMMIES

Jan 25

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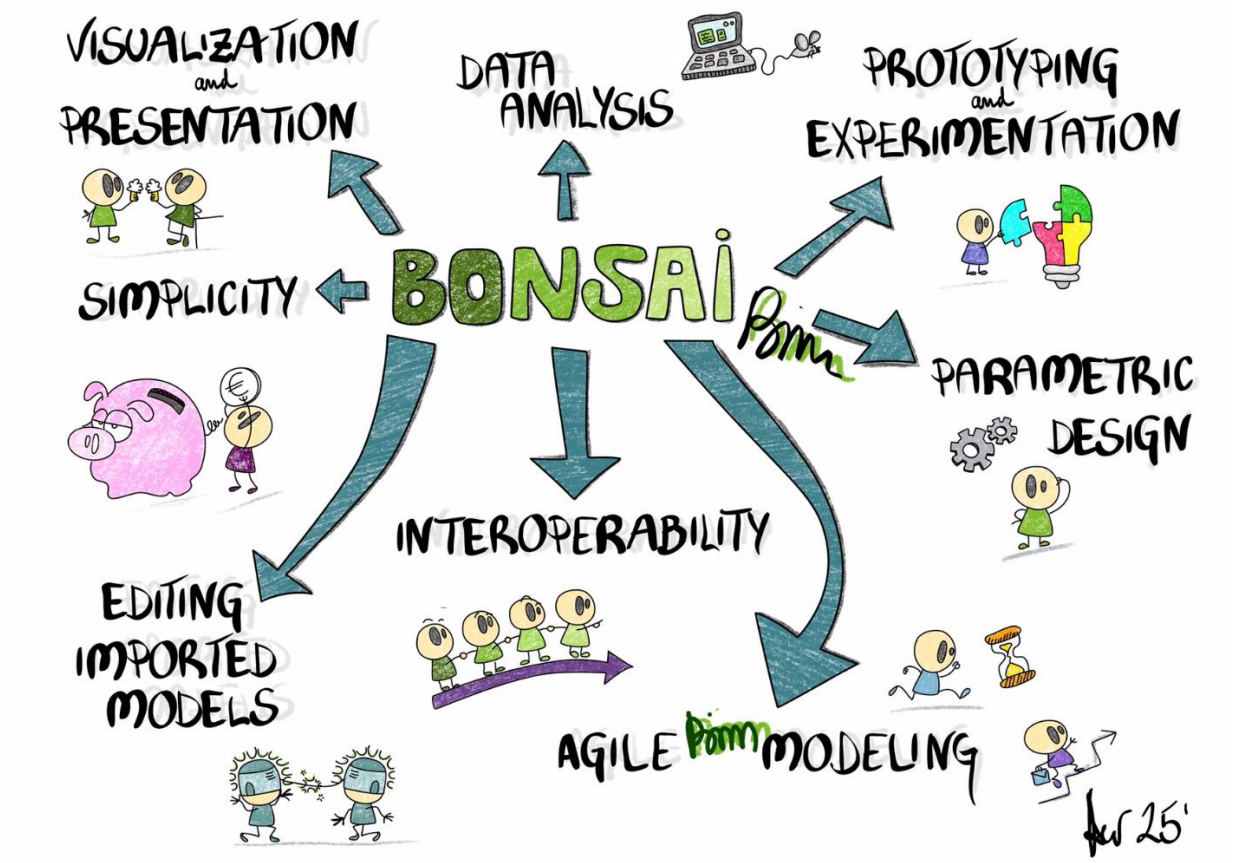
INTRODUCTION

What is BonsaiBim?

"The BIM software that helps you work less... and look like you do more!"

BonsaiBIM is a tool for working with IFC (Industry Foundation Classes) models in architecture, engineering and construction projects. What does that mean? That you can design, modify, and manage construction information like a pro, without having to deal with heavy or expensive software.



Purpose of the Manual

"Because mastering BonsaiBIM should be as easy as pressing a button... and not losing your mind in the process!"

This manual is your guide to mastering BonsaiBIM without losing your patience (or humor). Here you will learn from the basics to advanced tricks so that, in no time, you will look like an expert in front of your colleagues.

> **Important note:** If at any time you feel lost, it's not the fault of the manual (obvious), but your lack of coffee. Go make one and come back.

To whom is this document addressed?

"This manual is for you... yes, there is always something to learn, even if you don't know what an IFC is"

This manual is for:

- **Dreamer architects** who need to adjust details in their IFC models without falling into existential crisis.
- **Pragmatic structural engineers**, always looking for efficiency (and guilty of moving columns without permission).
- **Overwhelmed BIM coordinators**, who dream of managing models like a ninja.
- And basically, **anyone who is curious about the BIM world**.

An important concept

"A BIM model is not magic, but sometimes it feels like it is... if you know how to make it work"

A **BIM** (Building Information Modeling) model is a three-dimensional (3D) digital model that represents in a detailed and accurate way all aspects of building Project. But it's not just a pretty drawing; it is a data management system that includes all the relevant

information: geometry, materials, physical properties, and how the building will behave throughout its life cycle.

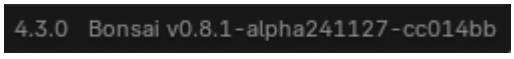
In other words, a BIM model is like a gigantic database of what you want to build, where everything you need is (if you know how to search for it). You don't have to be running around looking for what material it is, how much it costs or whether it has been executed or not. Of course, *spoiler alert*: there is no magic button that gives you everything with a single click. Making a complete BIM model, with all that data, requires hard work and software to help you manage all that.

> **Beginner tip:** If you're waiting for a BIM model to make your coffee and solve your life, you'd better relax. What it will do is make things much easier for you... if you put the effort into it. Nothing in life is free!

Software version

"Yes, there is always an update, but breathe: it is not that complicated"

Before you start, make sure you're using the latest version of BonsaiBIM. This manual is based on Blender version 4.3 and Bonsai version **0.8.1 (unstable)** To check your version look at the bottom right of the screen... There are always hints.



Software Installation

"When installing a program is easier than assembling IKEA furniture (and without any leftover screws)

Installing BonsaiBIM is so simple that even your cat could do it (well, with a little help). You have two ways to do this, depending on whether you're connected to the internet or if IT is lurking around like hawks.

Option 1: Direct installation from the browser

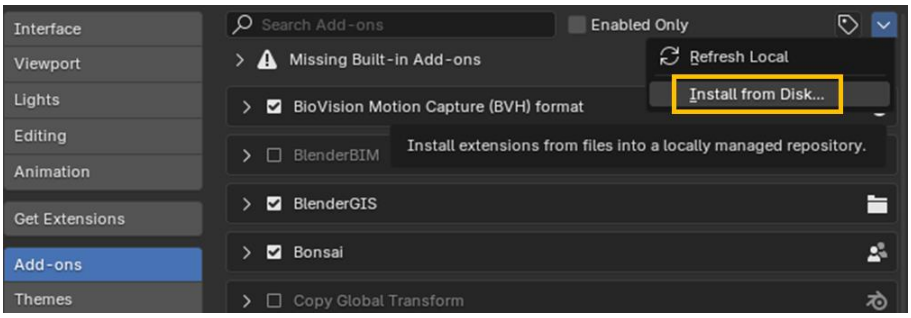
This is the quick and elegant option, perfect if you have internet and there are no restrictions on your network (thanks, public cafe).

1. **Go to the Blender extensions page.** Don't worry, you don't need a compass or map. It's as easy as searching for "BonsaiBIM Blender extension" on Google.
2. **Drag the extension into Blender.** Literally, grab the file with your cursor and throw it into the Blender window. BOOM!. It's magic, but no bunnies.

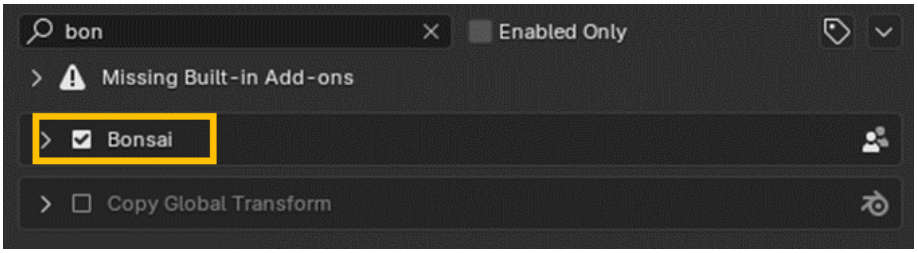
Option 2: For those on a tight IT leash

Can't roam freely because IT is watching you like a reality show? No worries, there's a solution for you too:

1. **Download BonsaiBIM from another connection.** Go to the same Blender extensions page, but this time download the file to your computer (yes, the classic method).
2. **Open Blender and go to *Preferences* > *Add-ons*.** Click the **Install from Disk** button and select the file you downloaded.



Once installed, look in the search box of the add-ons window and activate it:



To get the most out of this tool (and not make a fool of yourself), it is recommended to consult the documentation available on the application's website. Don't worry, it's not a maze, just follow this magical link: https://docs.bonsaibim.org/.

Typical Problem: *Why won't it open after installation?*

Don't worry, you're not the only one who thinks your computer has a personal vendetta against you. First things first: close Blender and reopen it. Yes, it feels like magic, but sometimes it actually works

> **Tip:** If it still won't open, take a deep breath, blame the software (it's always the software's fault!), and head over to the OSarch chat for help. They've dealt with users on the brink of tech-induced breakdowns and probably have the fix. It's like group therapy, but for your tech nerves!

Optimization

"Because a slow Blender is like a car with square wheels: it won't get you anywhere fast"

To get the most out of Blender, follow these simple tweaks. Don't worry, it's easier than it sounds—and no, you don't need to be a computer wizard to pull it off. Ready? Let's dive in!

1. System Preferences

Go to **Edit > Preferences**, and then click the **System** tab. You've just found the control center to unlock Blender's full potential.

- **Enable OptiX:** It's like giving Blender a turbo boost.
- **Cycles Rendering Devices:** Check all the boxes here, especially the **CPU** and **GPU**. This lets Blender harness all the power your computer has to offer. Don't hold back—let Blender make the most of it!

2. Undo Steps

Nobody's perfect, and sometimes you make a mistake—like deleting the entire wall you just built. Let's make sure you can undo it.

- Go to **Undo Steps** and set it to **256**.
- This gives you lots of undo options, which means you can go back in time and fix your mistakes without worrying about losing everything. It's like having a time machine for your work!

3. Online Access

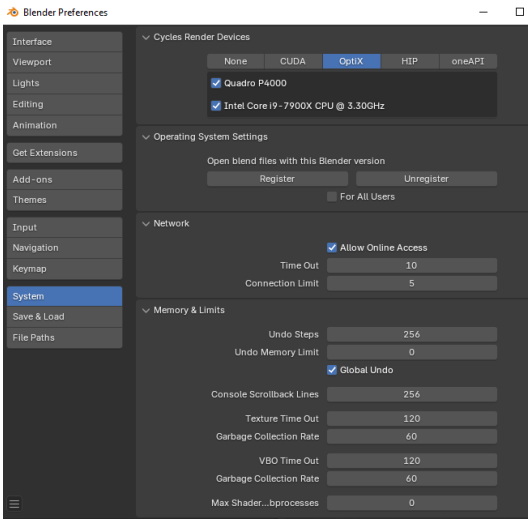
Blender can use some online resources to make your work smoother.

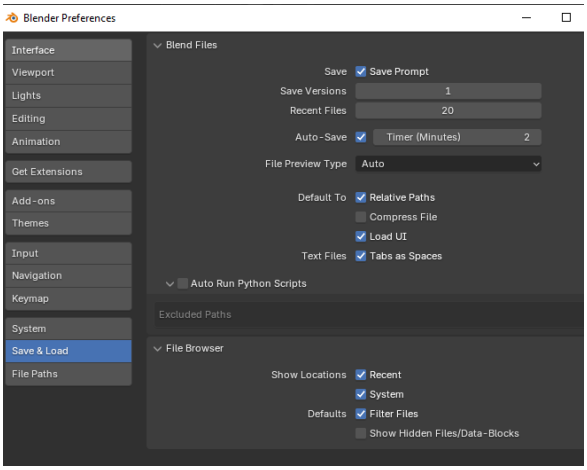
- Enable **Allow Online Access** so that Blender can use whatever internet resources it needs to improve its performance. It's like letting Blender eat all the vegetables to grow strong.

4. Auto-Save

Imagine working for hours and then—*boom!*—your computer crashes (infuriating, right?). This is where Auto-Save swoops in to save the day!

- Go to **Save & Upload** and activate **Auto-Save**.
- Set the **auto-save interval** to what feels right for your workflow—neither too fast nor too slow, just like Goldilocks' porridge.
- **Important:** Auto-Save doesn't overwrite your original file; it saves to a temporary folder (like a safety net). If Blender crashes, it'll catch you before you hit the ground. But don't forget to press Ctrl + S regularly to save manually. Your future self will thank you!





HOW'S THE INTERFACE?

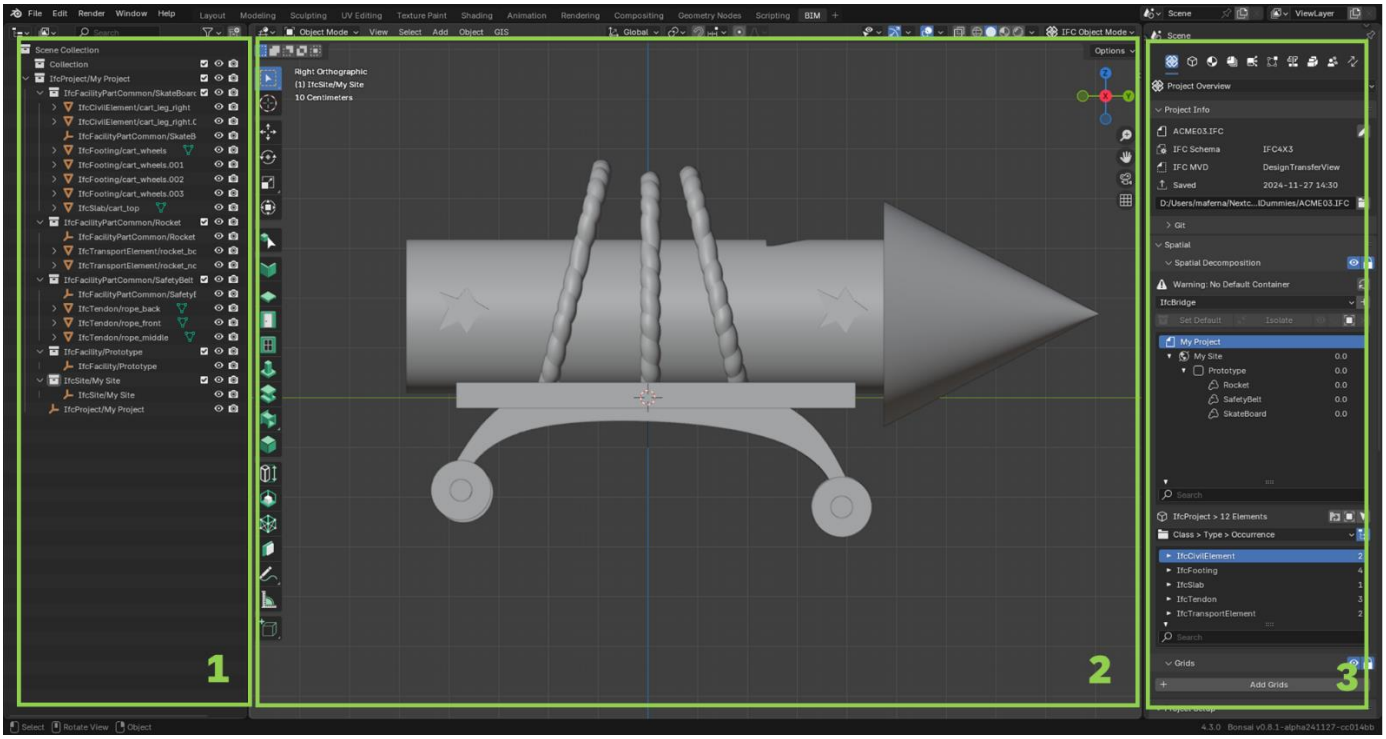
"Because even the best software needs a guide to avoid getting lost in so many buttons."

In this chapter, you'll learn how to navigate the BonsaiBIM interface like an expert (or at least look like one). Its design is designed so that you can work with 3D geometry and non-graphic data without going crazy. Let's break it down into parts so you know what does what.

Getting to know the BonsaiBim environment

"A treasure map to find what you need without asking every 5 minutes"

The BonsaiBIM interface is organized into **three main zones**, each with its specific function. Think of them as the key pieces of a BIM puzzle. Here's a quick look:



Zone 1: The IFC Entity Tree (Left Panel)

- Here you'll find a hierarchical tree that shows all the IFC entities in your model, like a guest list for a party... but with walls, windows, and pipes instead of people.
- What can you do here? Browse and select any part of the model to edit or admire (if you did a good job).
- **Quick tip:** If you don't find something on your model, it's probably here. Use the search engine and save time (and stress).

Zone 2: 3D Geometry Visualization (Central Area)

- In this zone, you can see the IFC model in 3D, ready for you to play around with, analyse and, if you're patient, perfect..
- You can rotate, zoom, select, and say "aha!" whenever something is misplaced.
- **Visual trick:** In this zone, you can see the IFC model in 3D, ready for you to play around with, analyse and, if you're patient, perfect..

Zone 3 Non-Graphical 3D Model Data (Right Panel)

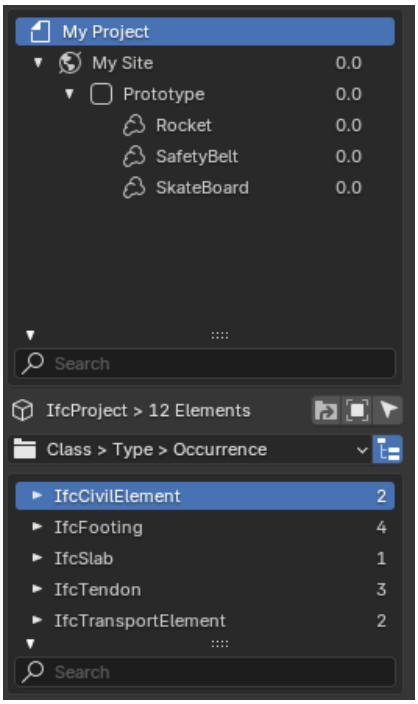
This panel is the brain of the model, where you can view, edit and make sure your model is well documented.Everything is divided into tabs that sound important (and they are).

Welcome to **Project Overview**, the tab where you can see overall **project data** without having to juggle a thousand tools. Think of it as your **roadmap** for everything that's going on in your IFC model.

Some of the things you can do:

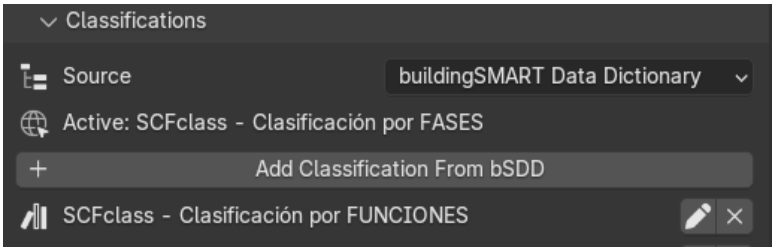
- Look up general project information (Project Info), such as the project name, author and other key data that, while not the most exciting, is what keeps things organised (and you from getting lost).

- **Spacial Decomposition** A structured map of your IFC model. It's like the list of rooms in a video game: you know where everything is and you can move them if necessary.



- **Property Sets Templates (Pset):** You can generate the templates for all the Pset you want to use for each element, you will be more pro than Marie Kondo.
- **Georeferencing**: If you like your project to be well-placed in the real world, this is where you can make sure your model is in the right place on the planet. Because, of course, we don't want your building to be floating in space, do we?
- **Filter model elements** : If you have a giant model and don't know where to start, this is your secret tool. Filter elements, find what you need, and organize your project like a pro. It's like having an **advanced search button**, but without the need to be a computer genius.

- **Federate models**: Do you have multiple IFC models that you need to put together in one space? No problem, this tab also allows you to integrate different models as if you were creating a mega building project with your LEGO blocks.
- **buildingSMART Data Dictonary:** Translation: An elegant dictionary that defines terms and attributes so that everyone speaks the same BIM language.
- **Classifications:** Enable classifications for elements of the model. Think of this as labeling your stuff so you don't mistake a wall for a couch.



And that's not all. **Project Overview** does more than just organize things. It's like a silent superhero working in the background so that your project stays under control, even if you never see it in the action movies!

Object Information

The **Object Information** tab is where you can manage all the details of each element of your IFC model. Here you can access the key information of each object and control everything related to its structure and properties.

Some of the things you can do:

- **Element data**: Get all the information about each object, such as its **IFC class**, which tells you what kind of entity it is (wall, window, column, etc.). It's like having a file for each element, with all its details.
- **Property Sets (Pset):** Property **sets** are like the detailed characteristics of each object. From dimensions to technical specifications, and everything is managed here, allowing you to customize the model according to the needs of the project.
- **Quantity Sets**: If you need to know how much material you are going to use or make a quick calculation of quantities, **quantity sets** give you all the information you need to make those measurements accurately.

In short, **Object Information** is where you manage and access all the crucial information for each element of the model, allowing you to have full control and make adjustments or checks with ease.

Geometry and Materials

This is the tab where you work magic with your model's shapes and materials. If you've ever thought, "How do I make this wall shape, texture, and not look like a Minecraft block?" this is the place for you. Let's get to it:

Some of the things you can do:

- **Geometry:** Changes the size, shape, and position of any element. Adjust things like "that column that was on the right when it should be on the left." It also allows you to leave your model like a Gruyère cheese, not smelling bad, but with many holes
- **Parameterization:** If you use parametric models (those that fit like plasticine), you can customize dimensions down to the millimeter or also repeat an element as many times as you like
- **Materials:** Apply texture, colour, and physical properties to material. From concrete to glass, decide if the walls are rough or shiny, if the ceiling reflects light or if you cook in a greenhouse. Define technical properties such as density (how heavy it is) or thermal conductivity (whether it retains heat or not).

In the **Geometry and Materials** tab you make your walls, ceilings, and columns more than just blocks. Here you give them shape, personality and even technical life. It's like the model's make-up room, but with engineers clapping in the background.

Drawings and Documents

This is the tab where you turn your digital model into drawings, plans, and documents ready for printers, demanding bosses, and curious customers. If you've ever been told, *"Turn that on to a pretty shot,"* this is where you do it. Let's go with the details:

Some of the things you can do:

- **Create drawings (or the art of impressing the client):** Generate 2D plans directly from your 3D model, without having to take out the ruler or compass. You can take cuts, plan views, elevations and even those sections that no one asked for but that still look good. Customize everything: scale, detail levels, line weights, and, yes, even colors.

- **Annotate and label:** Add dimensions, labels, and explanatory notes to your plans so everyone understands what's what. Use tools to indicate materials, dimensions, levels, and any technical details. Make every last screw clear so that the construction team does not improvise.
- **Generate Documents:** Export your drawings in popular formats such as PDF or DWG to share with the team. Create sheets with your logo, headers, boxes and all the official paraphernalia that makes your plans look *pro*. Organize everything into sets of drawings so they're ready to print or send to the client.

In the **Drawings and Documents tab** you pull out the drawings and documents of the model like a chef pulling out a gourmet dish: quick, clean and ready to impress. All organised, clearly labelled and error-free, because nobody wants to explain why a door was left where it shouldn't be.

This is the tab where the building's **"systems"** come to life. This is where you control everything that is not the walls or ceiling, but which, equally, are **essential** for your building to run like clockwork. Think of electricity, plumbing, heating, ventilation... and no, it's not magic, it's engineering!

Some of the things you can do:

- **Define and manage systems:** Create and manage all the building's **technical systems**: electricity, HVAC (heating, ventilation, and air conditioning), plumbing, fire alarms, etc. Each system can have its own set of properties and technical specifications so that everything fits perfectly into the design. You can see how the different systems connect to each other. It's like throwing a party: you need to know how the speakers connect to the lights and food so that everything doesn't fall over.
- **Assign Computers and Devices**: Assign all **the equipment and devices** needed for systems to work. This includes **fans**, **pumps**, **plugs**, **thermostats**, and more. Each of these devices is strategically placed so that the system works without overloading anything. You can also check their specifications so that, for example, the plugs are correct for each type of device.

In the Services and Systems tab, you not only make sure your building looks good, you make sure it works. You organise everything from the electricity to the ventilation systems, making sure that the pipe doesn't cross the cable or that your building doesn't turn into a fridge. All well planned and connected, like clockwork.

Structural Analisys

This is the tab that shows that the model is not only beautiful, but that **it can withstand whatever is thrown at it**.

Some of the things you can do:

- **Define loads and forces**: Load means the weight and forces that the building has to support: people, furniture, wind, snow, earthquakes... everything that can make the building say, *"Oh, that's heavy!"* Here you define those loads and distribute the forces on the structures, such as beams and columns, so that everything is balanced and there are no surprises later. You can also set boundary conditions to let the building know what's around it.

The Structural Analysis tab is where your building undergoes an endurance test. It's like a strength test at the gym, but without the sweat. Here you can see if everything's balanced, if the forces won't wreak havoc on the columns, and if your design can withstand storms, winds or an army of penguins. All to make sure that when the time comes to build, it won't collapse before its time.

Costing and Scheluding

The tab where you turn your building dreams into **budgets and calendars**! If you've ever heard someone say "money doesn't grow on trees," this is the section where you make sure you don't spend your entire budget on a gold wall or a marble pool. Here you manage **money** and **time**, two of the most precious resources in any project.

Some of the things you can do:

- **Set the budget**: Here you can define the cost of each material and work involved in the project. The tab helps you calculate how much everything from concrete to electrical wiring is going to cost without having to pull out the calculator (or cry in the process).
- **Create the schedule**: Define the start and end dates for each phase of the project: from excavation to installation of the lamps. You can assign specific tasks to workers or contractors, making sure everything is ready on time and without headaches. Visualize the schedule on a timeline (it's like having a giant calendar screaming at you when something is late!).
- **Progress Tracking**: Track in real-time how the project is progressing. Is the plumbing contract overdue? Is the masonry team ahead of schedule? Here you can see everything. You can compare actual progress to planned progress, to

make sure everything is going smoothly, or make adjustments if you're falling behind.

- **Resource** forecasting: This tool allows you to calculate how much material you will need in each phase of the project and when. It makes sure that you are never short of materials in the middle of the work (or that there is so much left over that you have to return an entire truck of cement).

The **Costing and Scheduling tab** is where you turn your cool design into economic and temporal reality. Here you can adjust your budget, organize your time, make sure resources are used efficiently and that your project doesn't fall through the cracks. This way, you not only ensure that your building stays standing, but also that you make it to the end of the project without ending up selling your car to cover the costs.

Do you know those buildings with the broken systems, flickering lights or plumbing that sounds like a horror movie? Well, with this tab, that's a thing of the past! This is where you become the maintenance superhero, making sure your building continues to function perfectly even after you've handed it over. It's like having a virtual assistant take care of all the post-construction care!

Some of the things you can do:

- **Manage maintenance:** You can create and manage **maintenance schedules** for all systems and equipment in the building (the kind where you tell yourself, *"I'll do it tomorrow"*). Define when inspections and repairs should be performed: Every month, every year, or as soon as you hear a strange noise in the air conditioner? Keep everything organized so that systems keep running without surprises (like the elevator not working when you need it most).
- **Control assets and inventory:** Keep track of all **equipment and facilities** in the building: from appliances to HVAC systems. Keep an inventory of parts and materials so you never run out of tools when you need them most. And you can know exactly where those extra bulbs or that special faucet you need to fix everything are!

The **Facility Management** tab is your secret weapon when it comes to keeping your building in top shape. You're the boss, calling the shots on repairs, replacements and materials inventory. You're in control the whole time, scheduling maintenance, keeping performance high and making sure everything keeps running like clockwork. Your building stays in mint condition, and you're the hero of the building maintenance world.

Quality and Coordination

Th ab is like your personal workshop for tuning IFC models. Here you'll find essential tools that will make your life easier, from extracting data to merging projects to adjusting sources (all in a couple of clicks).

Here are some of the things you can do:

- **Debug models**: Organize and clean up your model to make it more efficient and manageable.
- **Small programs** that will help you in things with element extraction, element data, merging...
- **Clash Detection**: Detect those clashes between elements that could ruin the project (or your reputation).
- **BCF file management**: These files are like your GPS: they guide you directly to the problems in your model, straightforwardly.

Getting Started: Opening and Exploring an IFC Model

"Because the first thing is to open the file... and then not lose yourself in it"

OPEN AN IFC FILE

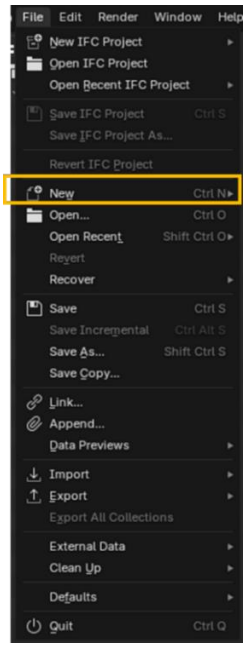
1. Go to the **File tab** (yes, the one that seems obvious but we never use it until we need it).
2. Haz clic and **Open IFC Project**.
3. Select your IFC model and... voilà! You now have the BonsaiBIM model ready to be explored.

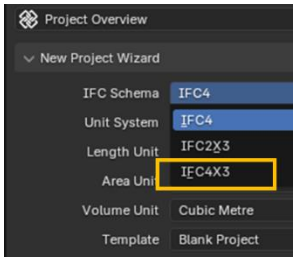
CREATE AN IFC FILE

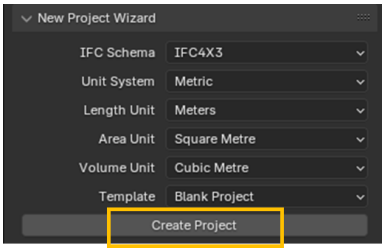
1. Open **Blender** and go to the **File tab > New**. This creates a blank file where you will start your BIM journey.
2. Once you have the file, open the **Project Overview** tab in the Bonsai extension and select the **IFC 4x3 scheme**.

- *Why IFC 4x3?* Because it is the most recent version and optimized to work with updated standards.

> **Just a heads-up**: if you open an IFC file straight from File, Blender will use the IFC 4 scheme by default. This isn't a bad thing, but it's not ideal. The better option is to create the new file in Blender and select IFC 4x3 manually.







IFC DESIGN & EDITING

" Hands on: create and modify your model like a BIM master"

In this section, we're going to take a look at how to create your IFC model from the beginning. And if you're like us, you'll probably want to modify those elements that didn't turn out the way you expected (because, let's face it, that's half the fun). So get your virtual helmet on and get ready to build and tweak like a pro.

Introduction to design

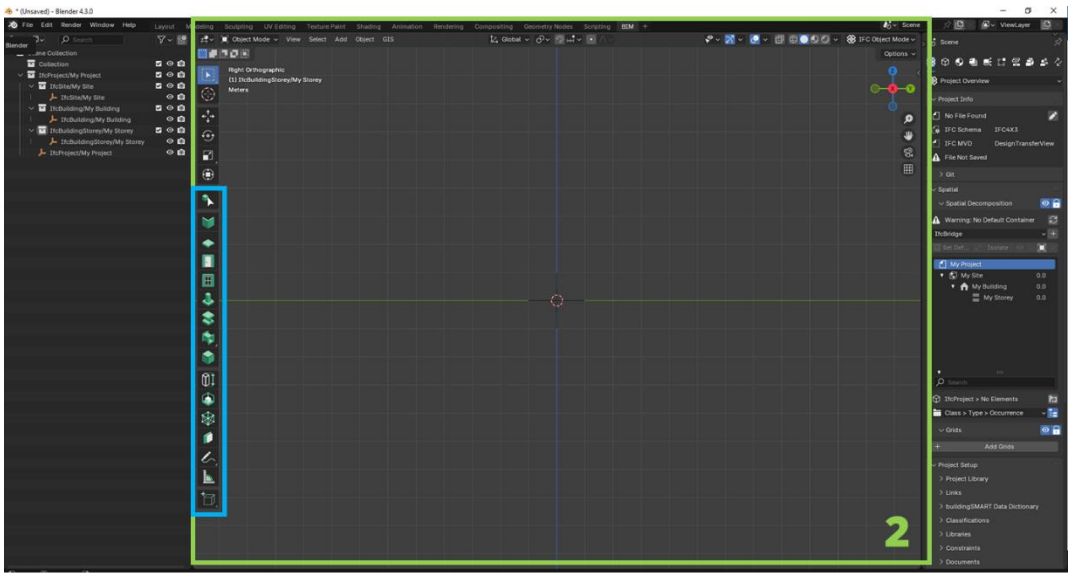
You've already installed Blender, added the Bonsai extension, and now you're in front of a jungle of buttons that seem more mysterious than a secret recipe. Don't worry, here we start shaping your model step by step.

Exploring the Bonsai pop-up

In zone 2 you will find a drop-down full of icons. Each represents a predefined **IfcElementType** (such as walls or windows).

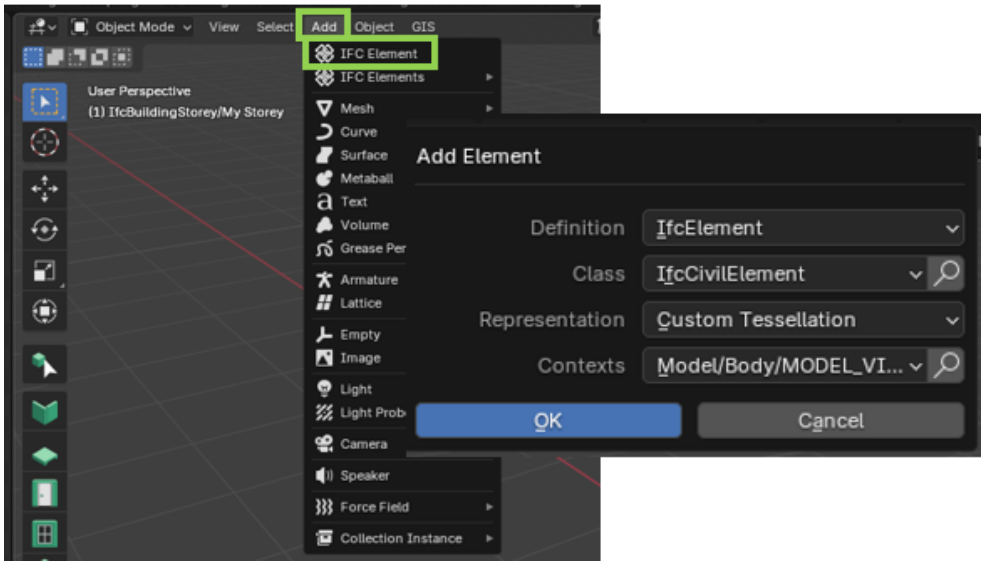
These elements are the basis. You shape them geometrically and they automatically become the **IfcElement** you selected.

This drop-down is mainly aimed at building elements, but if you are looking for something more generic, you can also create it

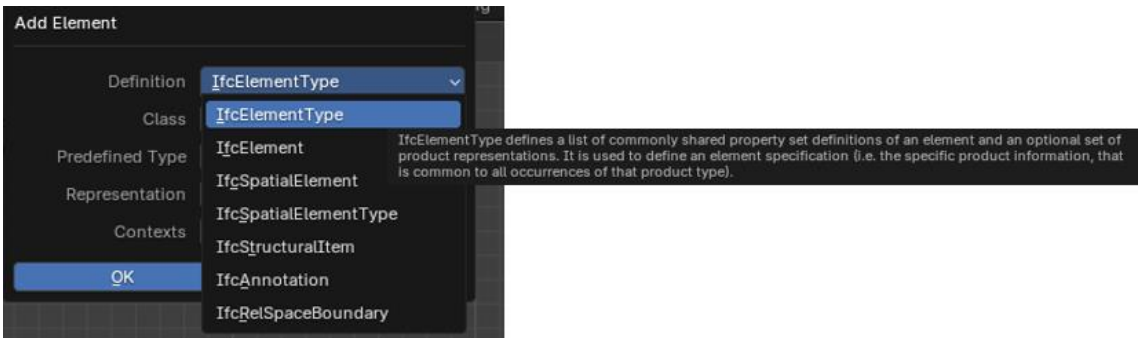


Creating Generic Elements

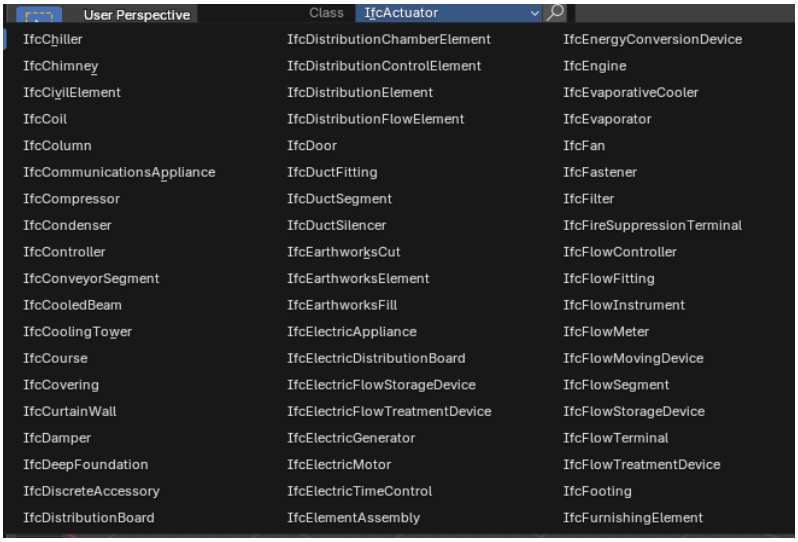
Go to the **Definition section**. Here you select the entities that will classify your object.



If you doubt about any entity, put the cursor over it; An explanation will appear (although sometimes you'll need your imagination to figure it out).

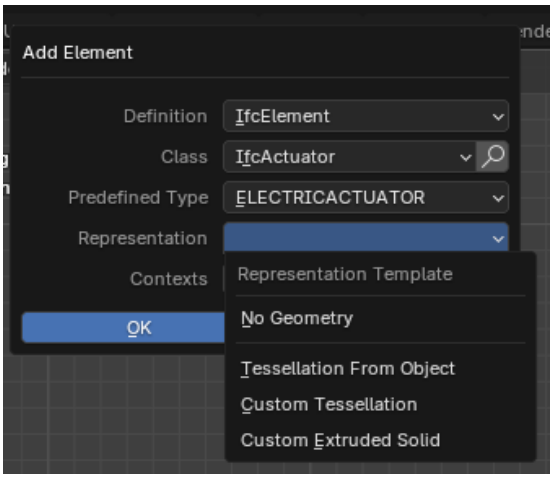


In **Class**, you'll sort your object within the chosen entities. Everything is sorted alphabetically so you don't go crazy searching.



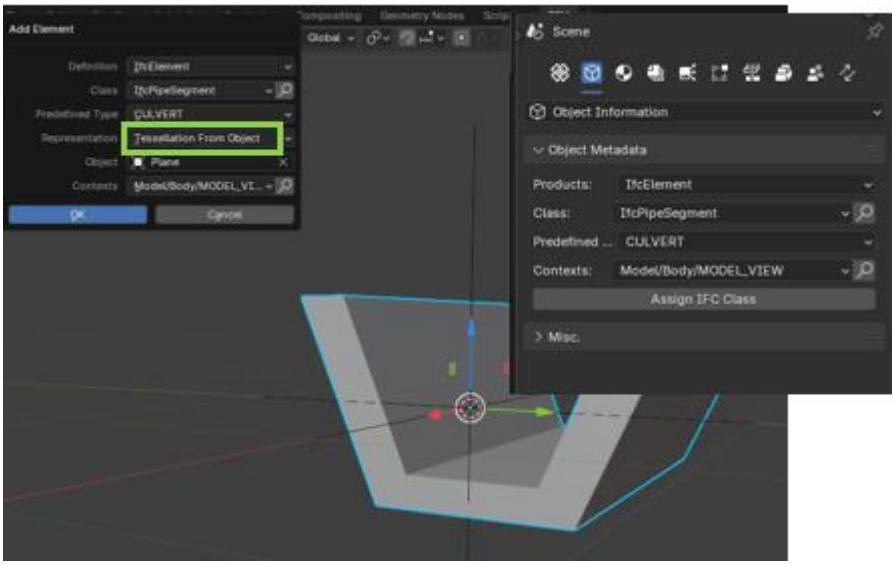
What about representations?

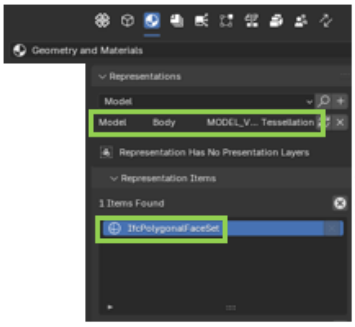
In the **Representation section**, you decide what your object will look like. You can choose between:

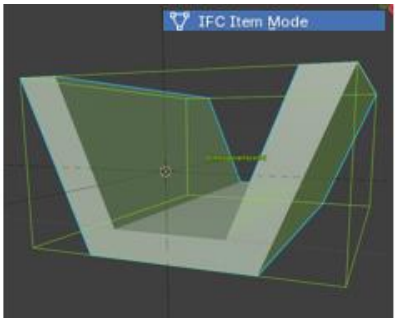


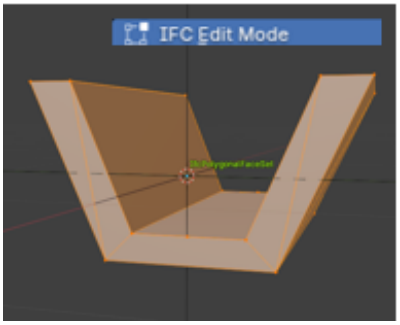
1. **No Geometry**: The object doesn't have a graphical representation, making it perfect for information elements.

2. **Tessellation From Object**: You can use an object made in Blender, which is great for custom designs like beams or gutters or hyperbolic cosine walls.

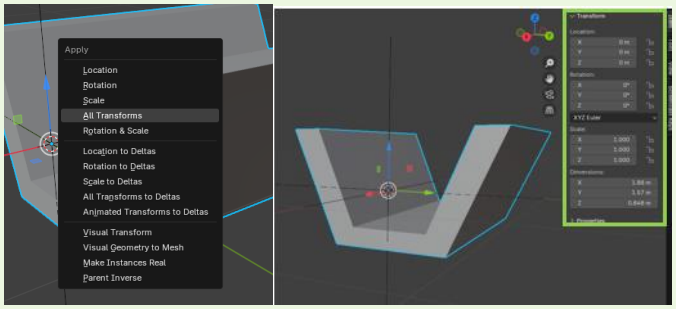




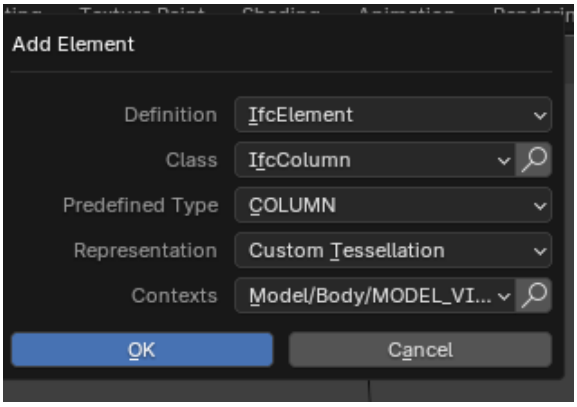


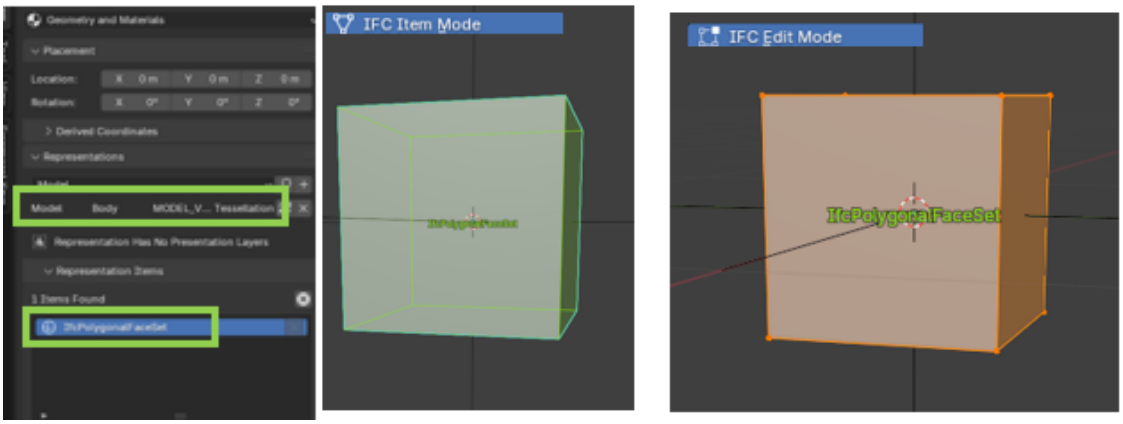


Important Tip: After modifying your object in Blender, press Ctrl+A and select Apply All Transforms to avoid future problems.

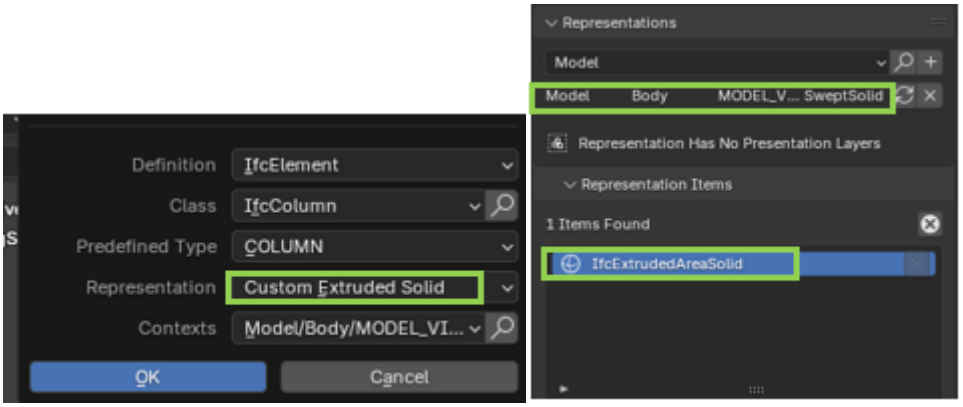


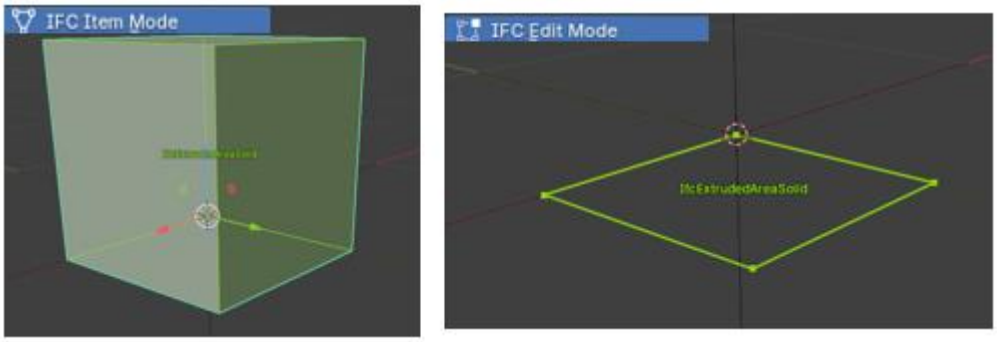
3. **Custom Tessellation**: More advanced and personalized representation.





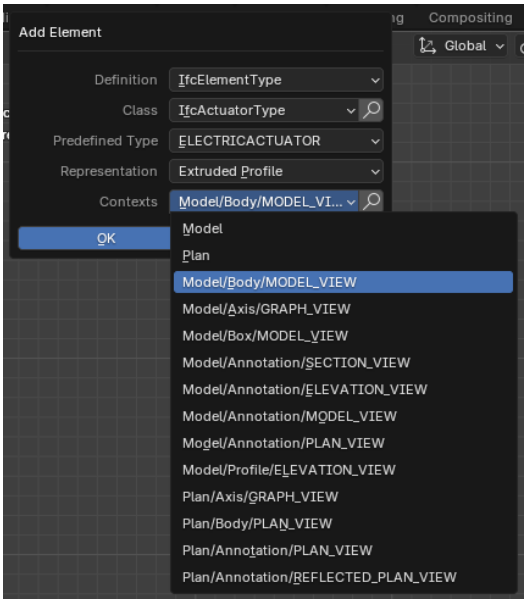
4. **Custom Extruded Solid**: Useful for linear shapes that need extrusion.





Contexts: The last step of the drop-down

This is the closing of the definition process. Here you decide the context in which your object is used.



Sometimes, words just aren't enough – you need to see how it's done. So here's the ideal video for you! It's like watching a movie, but with less popcorn and more productivity. This video will show you how to define your building step by step, and best of all, in a very professional and easy-to-follow format. So, while you're enjoying your coffee, click on this link and in no time at all, you'll know how to add and organize everything like a real expert.

This video is a game-changer! Watch Video Tutorial

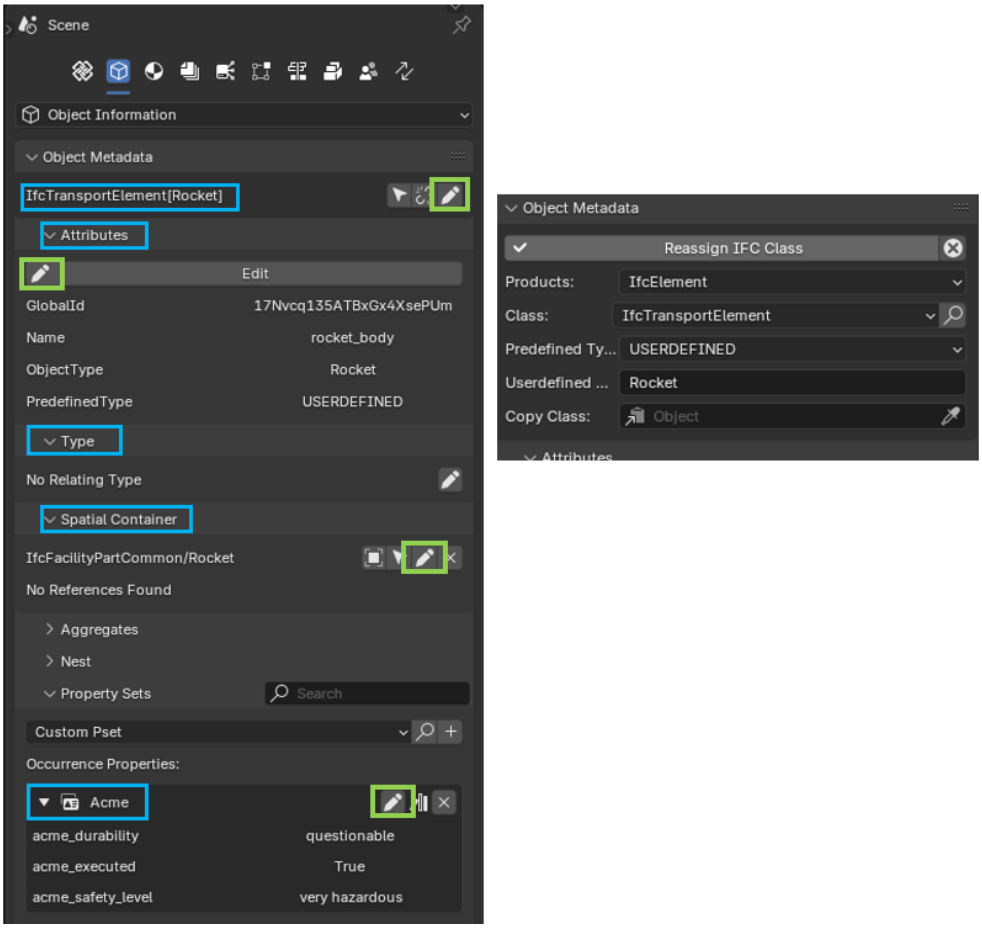
Modifying data: because changing your mind is also design

"The great thing about BIM models is that you can always tweak things… as long as you know where to look"

Sometimes we need to modify the data of our elements. It may be because we make mistakes, because we think better of it, or simply because we feel like it. The good thing is that Bonsai is prepared for these moments of reflection (or chaos).

From the **Object Information** tab, in the **Object Metadata** drop-down, you can do the following:

- **Reassign IFC classification**: If your item needs an identity change, this is the place.
- **Modify attributes such as name or type**: Because calling it "Muro_01" is not very inspiring, right?
- **Change its spatial container**: If you need to move it to another level or section of the project, use **Spatial Container**.
- **Edit Pset generated by us**: This is a bit of a spoiler because we'll get to it later, but yes, here you can adjust that custom data that you created.



Philosophical note: Changing data is like redoing a sketch. It's fine to do it, but make sure you don't mess up the rest of the model in the process.

Modifying and editing IFC elements

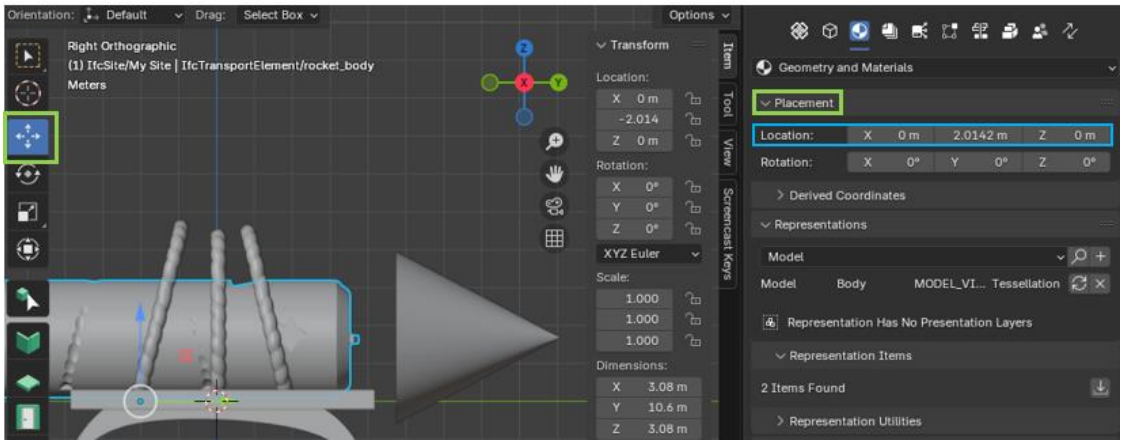
"Because mistakes are part of the design, and so are editing them"

Editing an IFC model might feel like a marathon, but don't worry, we've got you covered with a few essential tips to make this process as smooth as possible.

Changing the position:

- Go to the **Geometry and Materials** tab.
- In the Placement drop-down, you can adjust the position or rotation of the object.

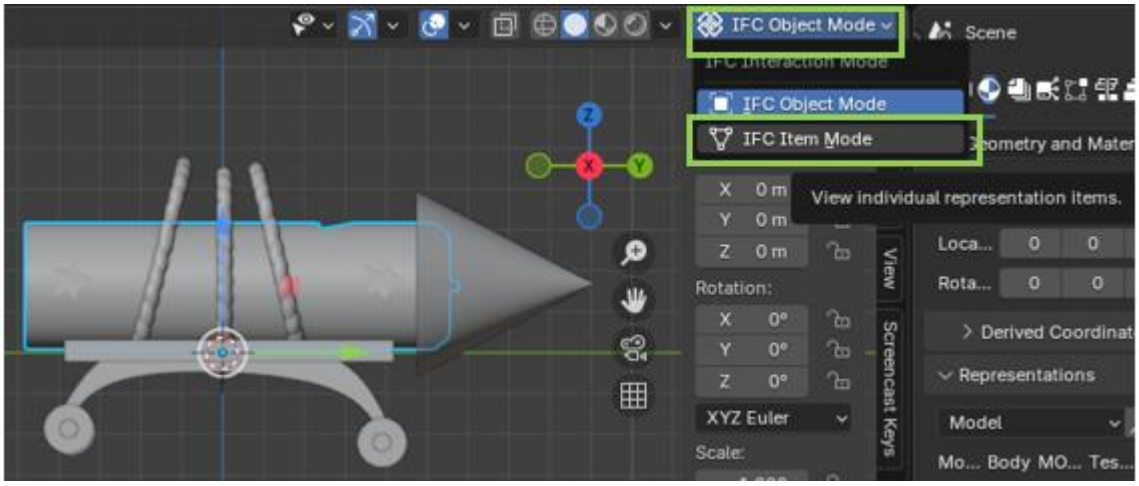
- Prefer visual focus? Use **Blender's Gizmo** to move the object, but remember to check the Placement dropdown to see that the movement is reflected there. Otherwise, it's as if you haven't done anything.



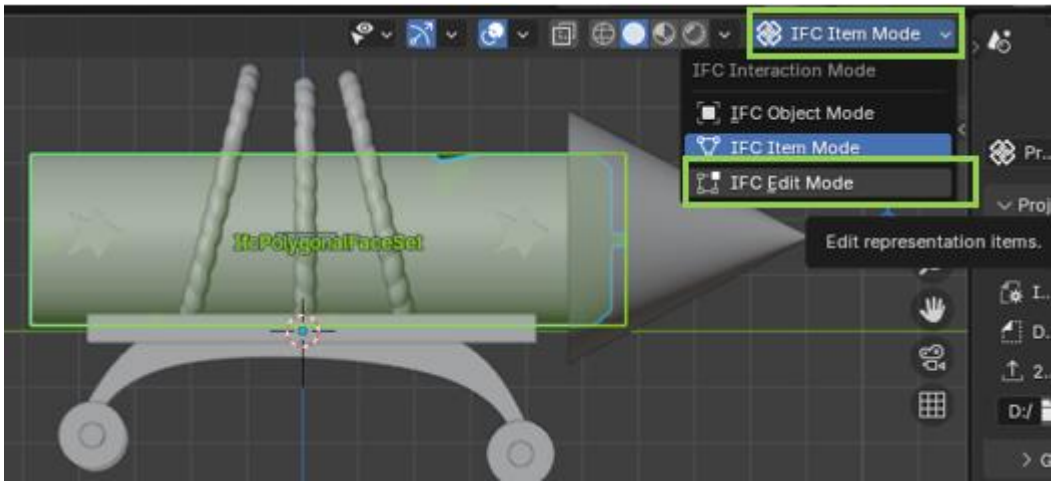
Modify the geometry

First, select the object you want to modify:

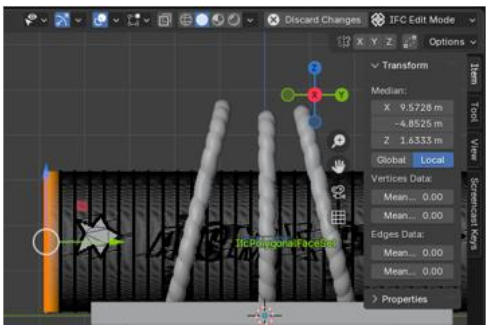
- Go to the **IFC Object Mode** drop-down and select **IFC Item Mode**.

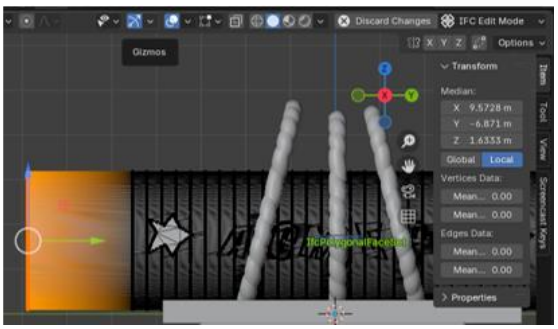


- Select the object again, and from the same drop-down, select **IFC Edit Mode**.

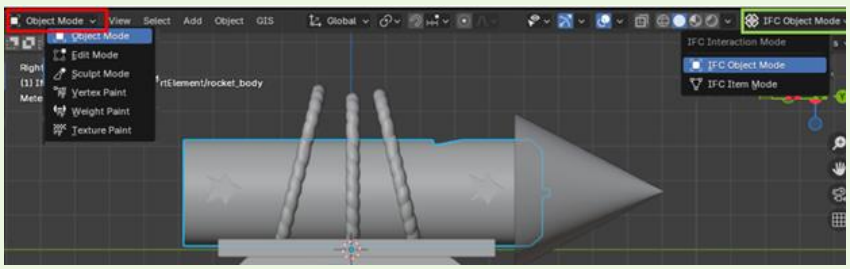


- Ready to edit!





Vital note: Make sure you edit in IFC Object Mode, not the standard Blender editor. Otherwise, your changes might be saved as a memory, but won't be part of the IFC model.



How to Make Holes in Your Design Without Making a Hole in Your Sanity

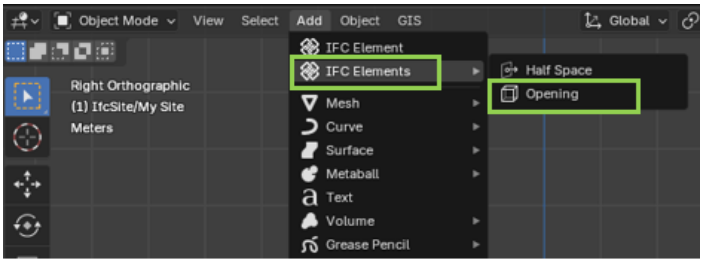
So, you forgot to add a door to that "award-winning" terrace design, need to connect plumbing between floors, or want a neat little hatch in a slab? Well, don't worry, you're not alone. Here's a simple guide to creating holes that even your mum would approve of.

Method 1: Using Voids (The Posh Way)

This is the "official" method—clean, precise, and ever so proper. Follow these steps:

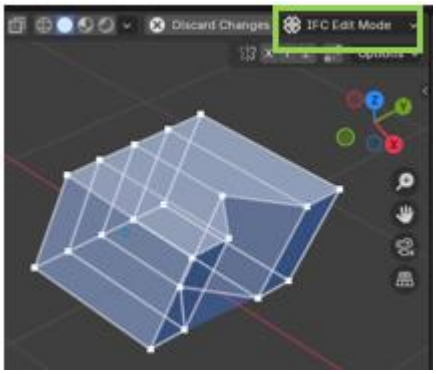
1. **Summon the Void**

   Go to: **Menu > Add > Ifc Element > Opening**. This essentially creates a placeholder for your hole. Fancy, isn't it?



2. **Shape Your Void**

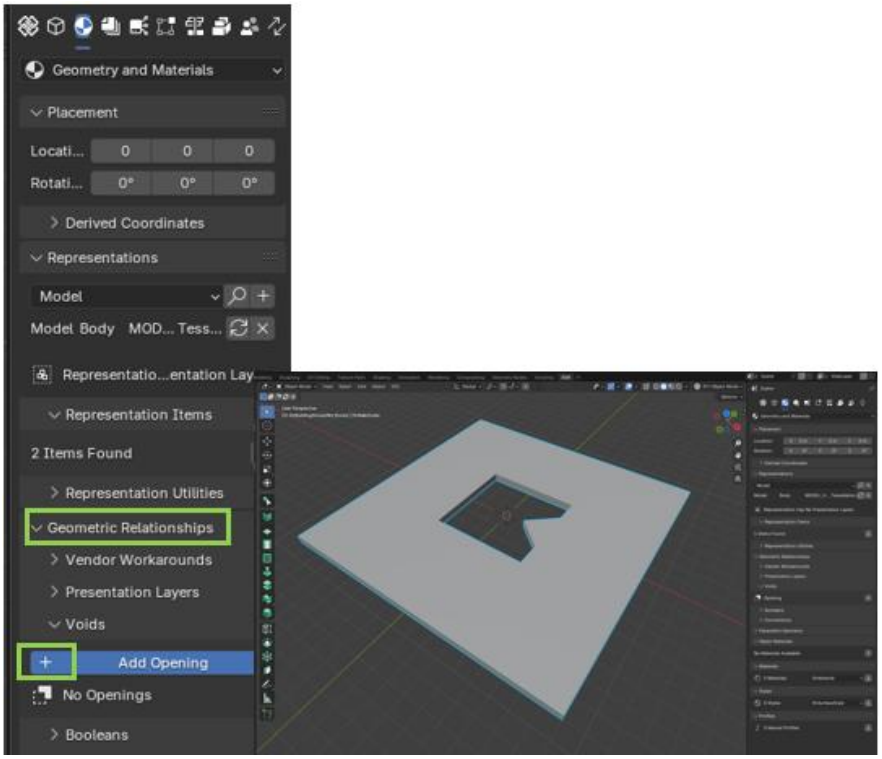
   Adjust the *Opening Element* to match your desired shape and size. A circle? A square? A doughnut? It's your masterpiece—don't let anyone tell you otherwise.



3. **Apply the Void to Your Object**

   - First, select the object you want to bore through (a wall, a slab, or that mistake you call a floor).
   - Then, select the *Opening Element*.
   - Head over to **Geometry and Materials**, find the **Geometric Relationships** dropdown, and choose **Voids > Add Opening**.

Congratulations! You've just added a hole the Queen herself would admire (probably).



Method 2: Boolean Magic (The Hands-On Way)

If you're more of a "let me do it myself" kind of person, this one's for you. Think of it as sculpting with Blender—only less artistic and more destructive.

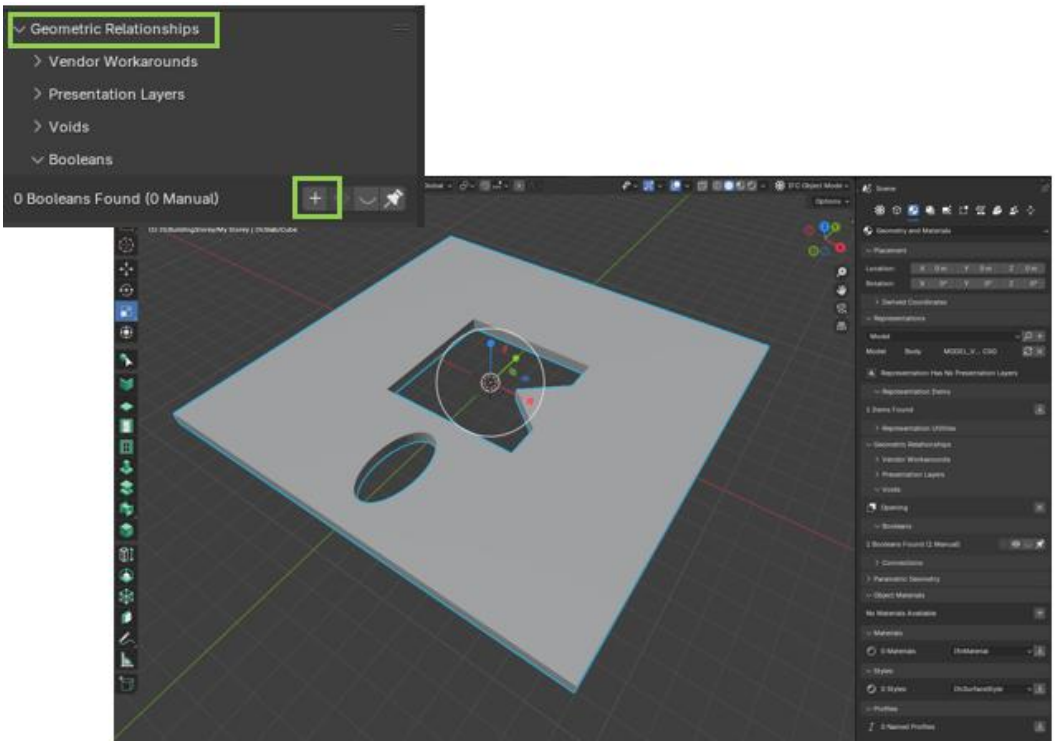
1. **Craft Your Cutter**

   Create a shape in Blender—be it a cylinder, a cube, or something avant-garde. This is your hole maker.

2. **Choose Your Victim and Weapon**
   - Select the cutter (your weapon of choice).
   - Then, select the object you want to perforate (your victim, poor thing).

3. **Slice and Dice**
   - Navigate to **Geometry and Materials**.
   - Under **Geometric Relationships**, pick **Booleans > Add**.

   And there you have it—one perfectly good object now ruined... but in the best way possible.



:**Save your work before creating chaos.** Nothing screams "rookie mistake" louder than a misplaced hole you can't undo.

- **Be patient.** Rome wasn't built in a day, and neither was your questionable design. Take your time to make sure the hole is where it should be (and not in your ego).

> **Pro Tips for Hole Enthusiasts** Always save your work before diving into the abyss of hole-making—nothing's worse than an accidental void in the wrong place. Take your time, double-check your placements, and remember: precision now saves embarrassment later.

Pset: Add, Modify, or Remove Property Set

"Because without the right properties, your BIM model is just an empty shell"

What are Pset? The literal translation is "*Property Sets*." Basically, they're the data attached to the elements in your model. We're not talking about shapes or dimensions

here but about the characteristics that describe how they behave or what specifications they have.

There are different types of property sets in IFC, which are generally grouped into two categories:

1. **Standard Psets**: Defined by IFC standards and widely accepted by the AEC industry. For example:

   Pset_WallCommon (for walls).

   Pset_WindowCommon (for windows).

   Pset_SpaceOccupancyRequirements (for space occupancy requirements).

3. **Custom Psets**: Created specifically for a project or company, adapting to particular needs, let's go the ones that you (or your team) invent for specific needs.

So why do we need Psets? Basically, for two things

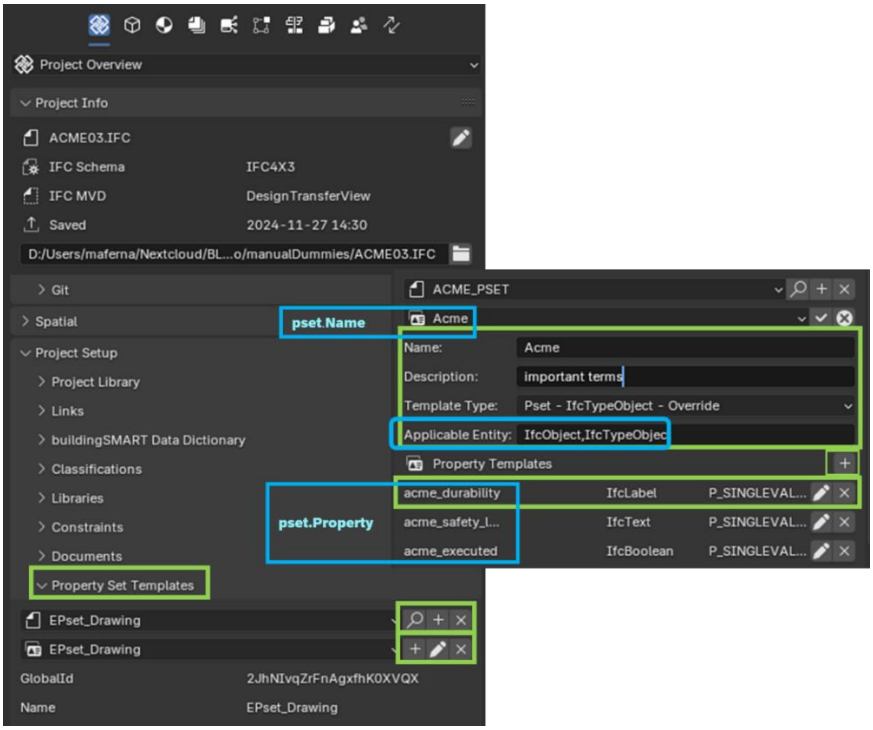
- **Standardization**: Ensures all your projects follow the same logic and structure.

- **Ease of analysis**: Need to filter specific elements? Without custom Psets, you'd be sailing in a sea of data without a compass.

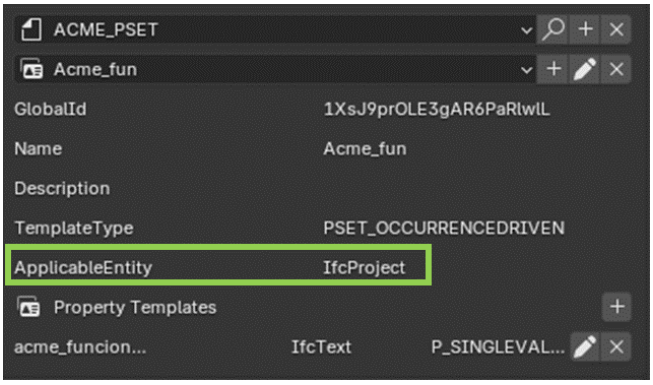
> **Note with love** Don't try to fill your model with Psets "just because it sounds good" or to impress your boss. A model with more Psets than necessary is like a backpack full of useless stuff: heavy and impractical.

Now let's see how these Pset are introduced into our model.

To add user-defined Pset (that's you) the first thing you need to do is create them, you have to go to the **Property Set Templates** tab: where you create a custom property set template (Pset) to adjust them to the needs of each user.



It is important to know that you can apply the Pset to the entity you want, for example if there are some Pset that are for the project in general, you have to indicate it in It's important to know that you can apply Psets to any entity you want. For example, if there are Psets for the project as a whole, you need to specify it under **ApplicableEntity**:



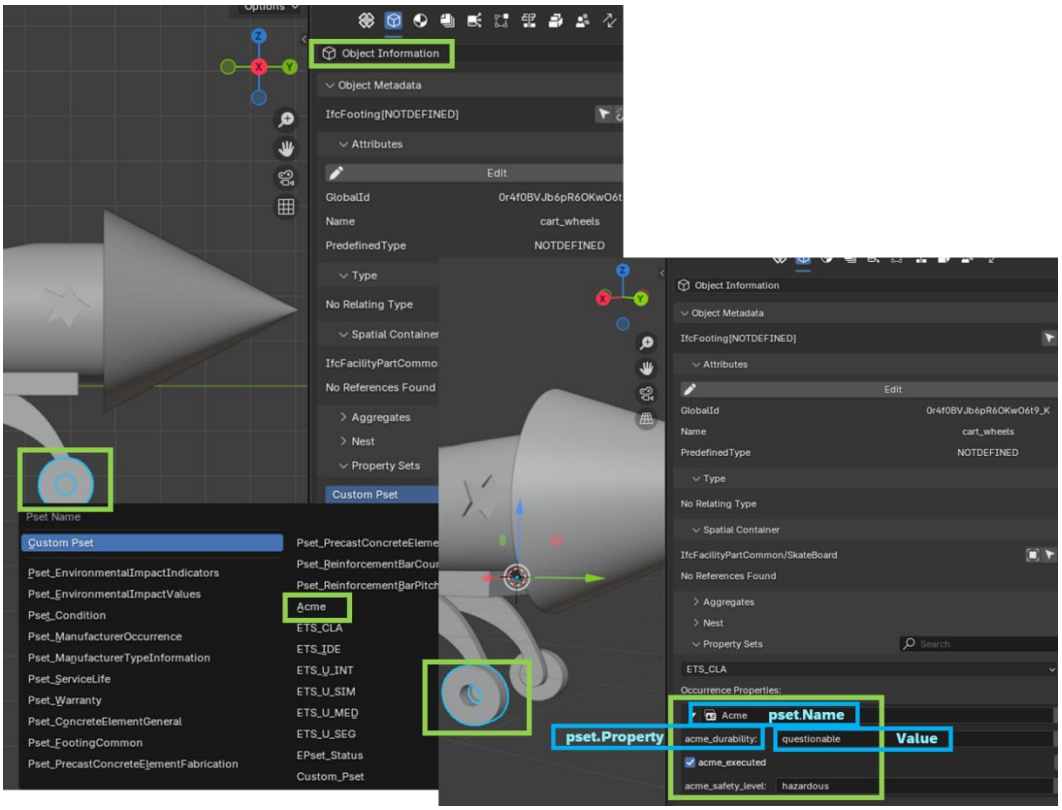
Tip: If you need to add specific properties, save them in this path: `C:\Users\user\AppData\Roaming\Blender Foundation\Blender\4.2\extensions\.local\lib\python3.11\site-packages\bonsai\bim\data\pset`.

These properties can be reused in other projects that require them. Do you have any questions? Watch this tutorial: YouTube

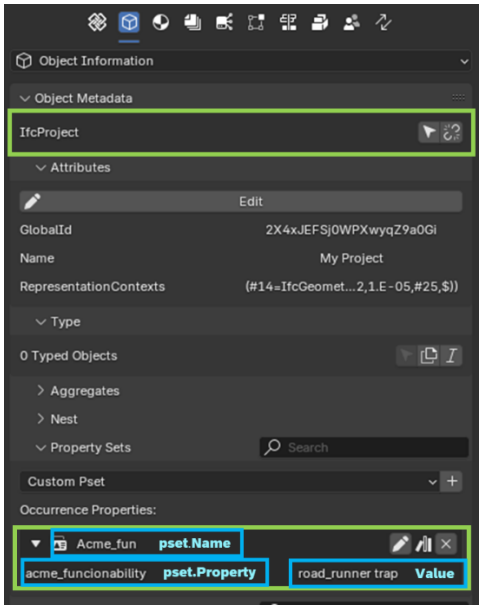
Introduce Pset: One by One or in bulk

If you're modeling from scratch and you're the organized type (you don't leave everything for the end), you can introduce Psets into each element one by one. Here's how to do it:

1. Go to the **Object Information** tab.
2. Open the Property Sets drop-down .
3. Select, within **Custom Pset**, the template you've already created.
4. Fill in the values of the properties you included in your template



This process is ideal if you're meticulous and like to go step by step, or if your model is still in diapers. Ah! And it works the same for the IfcProject entity



What if you have hundreds of identical elements?

This is where the bulk method comes in, because no one has time to go one by one when the clock is ticking.

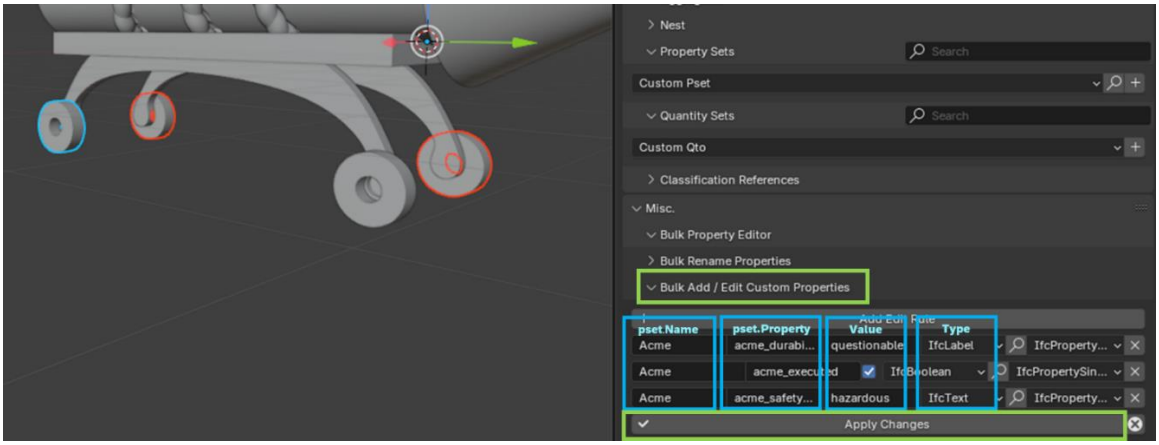
1. Go to the **Object Information** tab.
2. Go to the **Misc. (miscellaneous) drop-down** and select **Bulk Property Editor**.
3. From here you can:

    Rename properties: Change the name of the properties, but not their values.

    Add or edit properties: Enter the name of the Pset, the property, and the value. Also, remember to specify the entity type you used in your template.

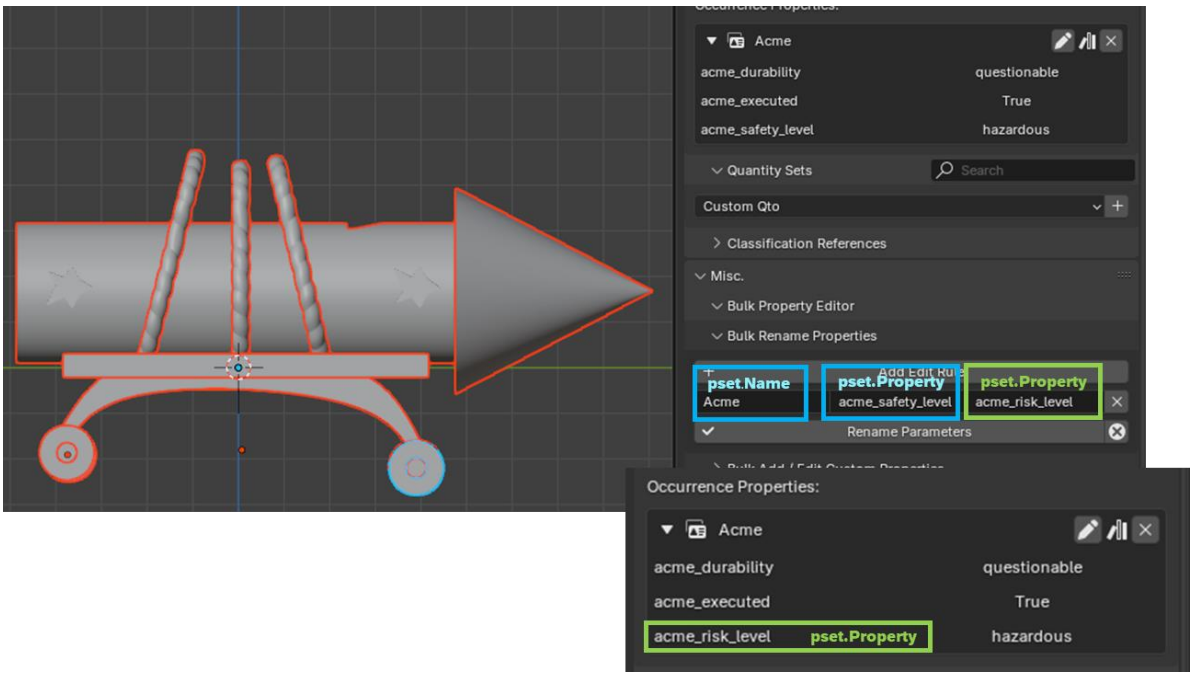
    Remove properties: Get rid of the ones you no longer need.

4. Select all the objects you want to apply these changes to.
5. Click **Apply Changes**. And you're done!



Important warning: If you edit properties, the object will only keep the properties you list. So, if you lazily decide to include just one, the rest will disappear. Better make sure you include everything you need..

..... **And one more thing,** renaming is just for changing the property name. If you need to edit the values, you'll have to go through "Edit." Do it right, and your model will thank you.



Georeferencing (WIP)

IFC MANAGEMENT

" Master your IFC model and turn it into a well-organized masterpiece (or at least, something that doesn't give you a headache)."

Welcome to the section where you learn to take full control of your IFC model. Here, we'll dive into organizing, filtering, federating, and even solving those tiny issues that sometimes make you want to toss your computer out the window. Take a deep breath, and let's get to work!

(Re)Organizing Your Model

Having a correct IFC schema in the model you're working with not only makes the data easier to manage, but also allows you to reuse it efficiently. This speeds up construction design and planning, reduces development times, minimizes last-minute changes, and improves overall project quality.

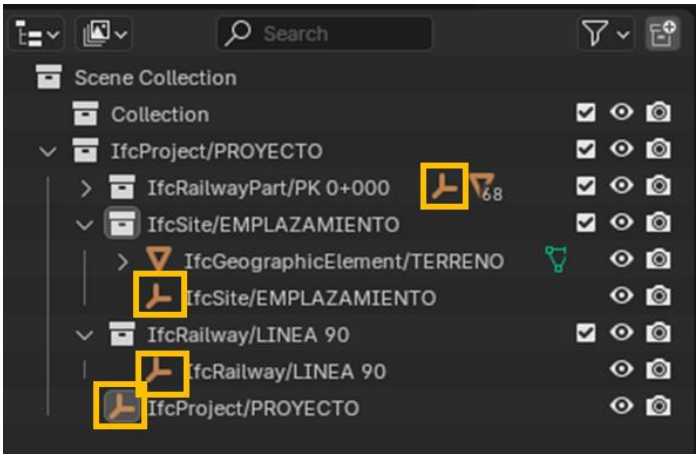
Where Do I Begin? Back to Zone 1, My Friend

Remember Zone 1? Time to revisit it, because that's where all the action begins.

There are two main types of things to edit:

- **Containers** (like IfcBuilding, IfcRailway, IfcBuildingStorey, or IfcRailwayPart)
- **3D Objects** (like IfcDoor, IfcSlab, or IfcFooting)

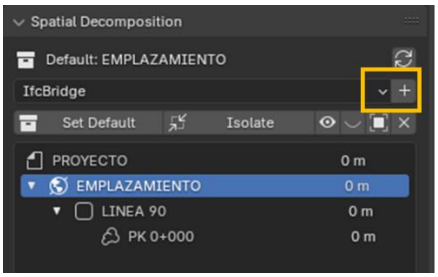
To edit them, you'll need to hover over the specific element. But here's the catch: if you want to tweak a container, you'll need to start with the null element (the one with the funky three-line symbol that looks like a futuristic emoji).

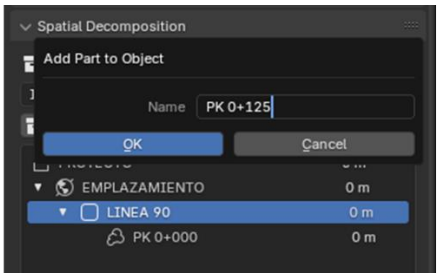


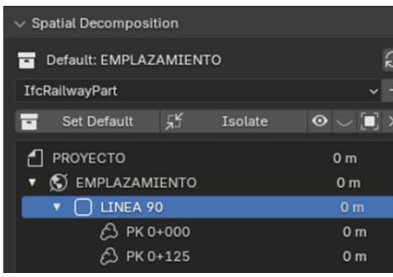
And Now, On to Zone 3

Navigate over to **Project Overview** → **Spatial Decomposition**. This is where you'll find the famous hierarchy tree. Think of it as an org chart, but for models (and way less boring). From this tab, you can:

- **Add new levels** (handy if your building suddenly decided to grow a few extra floors).
- **Remove levels** you no longer need (bye-bye clutter!).



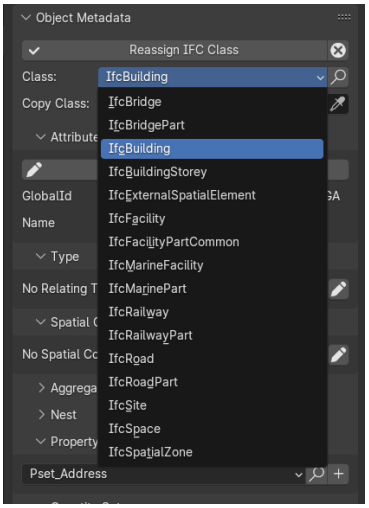




Switching Entity Types

Need to give something in the hierarchy tree a new identity? Head over to **Object Information** → **Object Metadata**. Pick the element you want to tweak, and voilà:

- **Reclassify it** to fit its true purpose.
- **Rename it** straight from the Attributes section (because no one wants a model full of "Object.001" chaos).

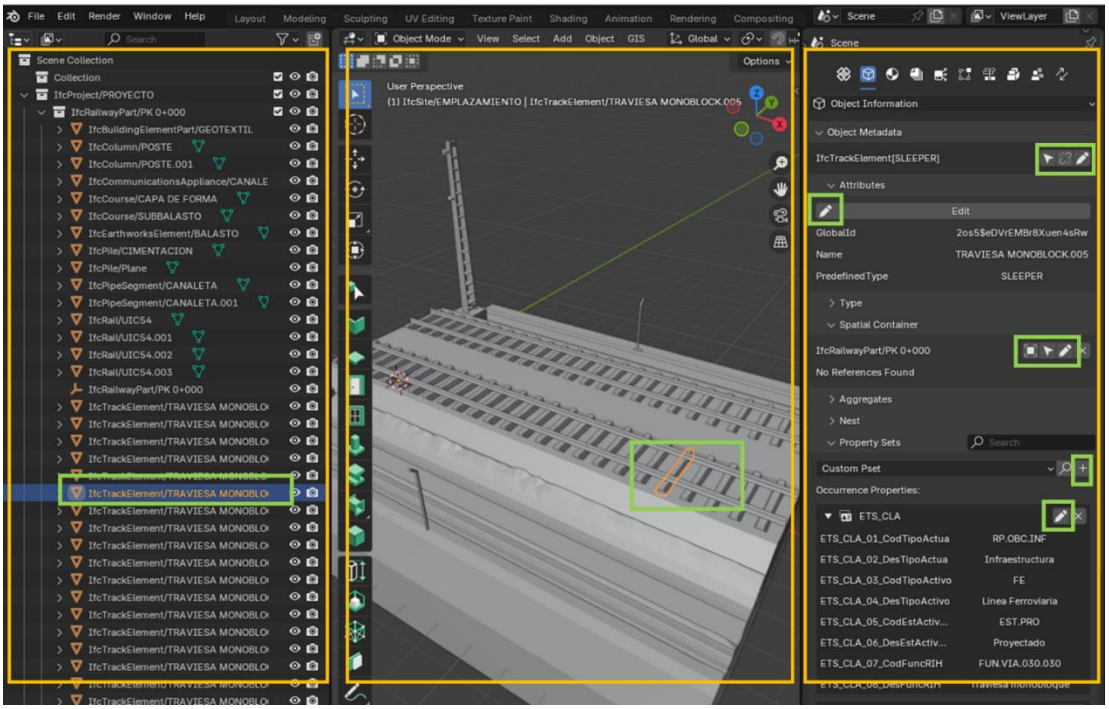


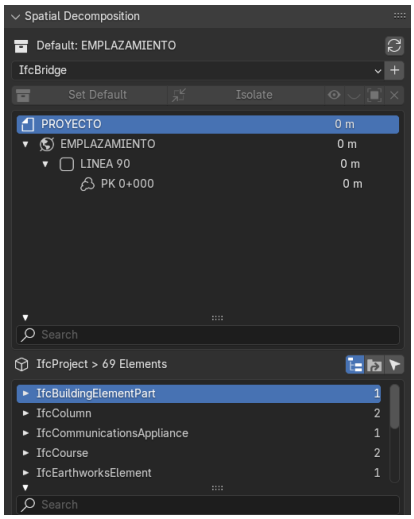
And What About Those 3D Objects?

Got a rogue 3D object with no proper mapping? Fear not. Click the "▽" symbol in **Zone 1**, and watch as your object magically lights up in Zone 2. From there, Zone 3 is your playground:

- **Assign it the correct IFC class** (finally, some structure!).
- **Rename it** to something sensible.
- **Place it on the right level** in the hierarchy tree.
- **Add or fine-tune its properties.**

It's like giving your model a well-deserved spa day.





Pro Tip: Keep your hierarchy tree neat and tidy. Think of it as your digital filing cabinet: the clearer it is, the less likely you are to lose your mind while working on your model.

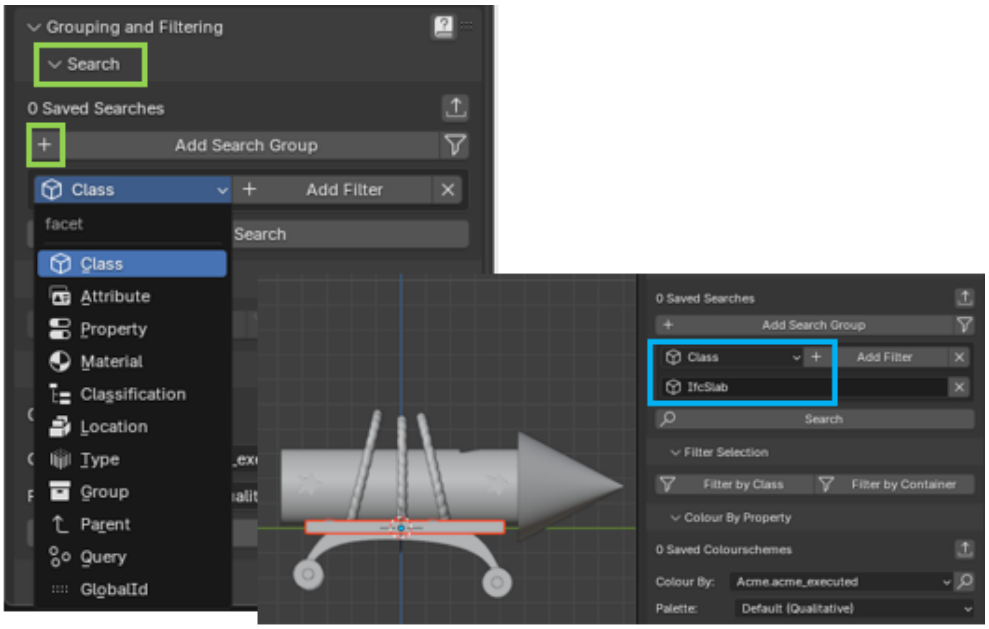
Filtering Elements

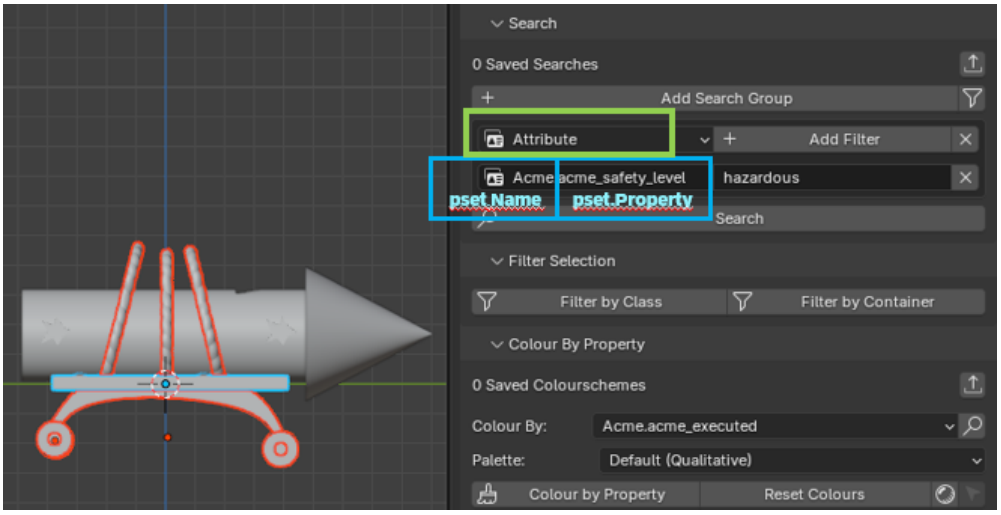
As we mentioned earlier, one of the main perks of a BIM model is the treasure trove of information it holds. And just like you'd filter a 20,000-row Excel spreadsheet, the best way to find what you need here is to apply filters.

BonsaiBIM comes with some pretty cool filtering tools. To get started, head to the **Project Overview** tab and open the dropdown **Grouping and Filtering**. Here, you'll find a variety of options:

- **Search:** This lets you search for elements based on their classification, material, Psets... basically, whatever you need.

Let's take a look at a couple of examples, like searching for elements by classification or those custom Psets you painstakingly created (because let's be honest, they deserve to shine).



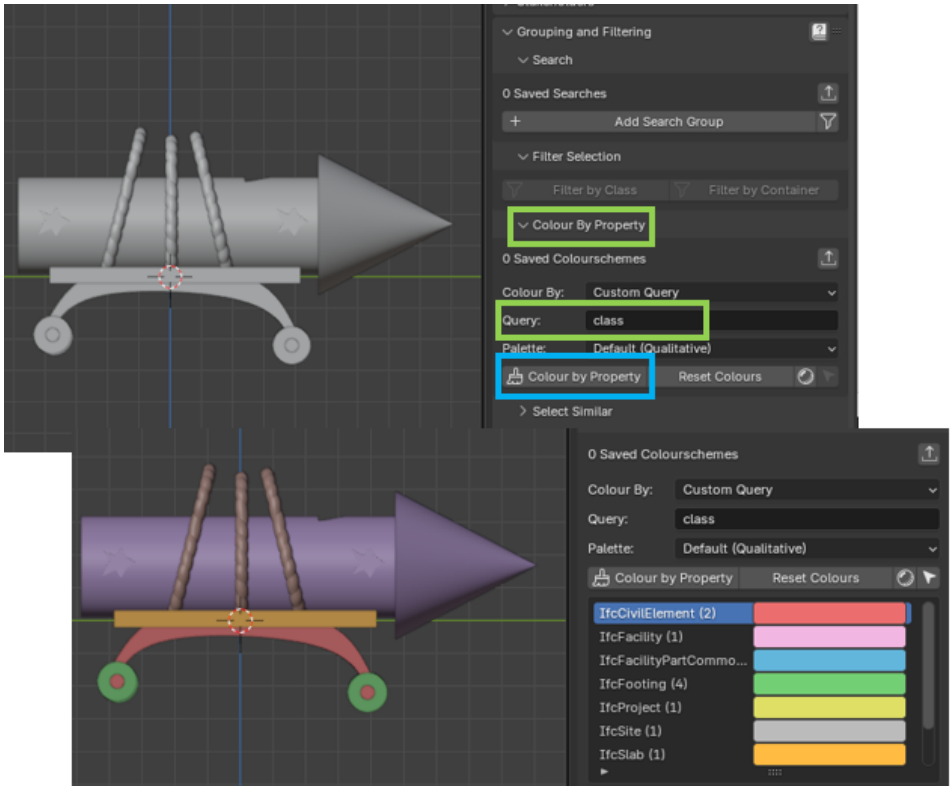


SuperTip If you've classified it as **ifcBoolean**, it will need to be either **TRUE** or **FALSE** (and yes, the capital letters are *very* important)

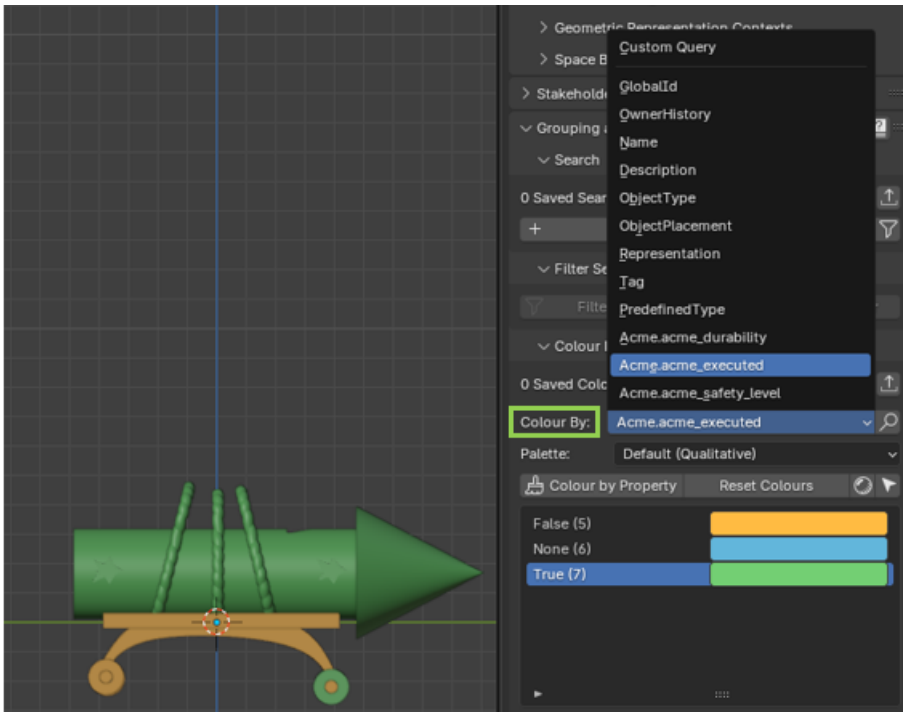
For its correct syntax it is recommended to see: https://docs.ifcopenshell.org/ifcopenshell-python/selector_syntax.html

Filter Selection: This one's all yours to play around with... it's pretty straightforward, promise.

Color By Property: Now, this is my personal favorite (I admit it, I'm a sucker for colors). It lets you see all the elements color-coded based on their classification—practical and pretty!



And now with our Pset, you can make Colour by the drop-down you want



Federate and Merge

"Aren't they the same? Nope, and here's why"

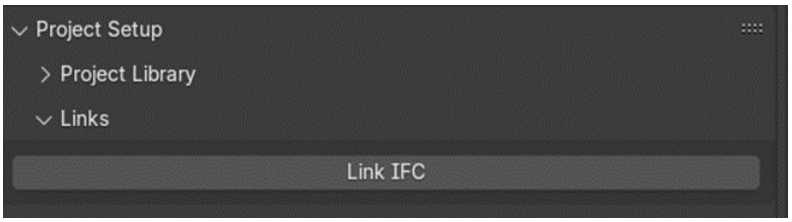
Federating means bringing multiple models into one workspace, but without combining them. Think of it as working in a team: each model stays independent. It's like a football match: you've got the forward (architect), the midfielder (structural engineer), the defenders (mechanical engineer), and the goalkeeper (electrical installations). Each one plays their role, contributes their "model" to the team, and works together to win. If something doesn't fit (like a missed pass), you can adjust it easily because each player remains independent.

On the other hand, **merging** combines everything into one file. It's ideal when you need a single, final file to share with others. Now imagine deciding to merge the team into one super-player. You take the forward, midfielder, defender, and goalkeeper and put them all together into one entity, thinking, "This will save time!" But soon, you realize the result is a bloated model: heavy and slow. In the end, instead of a functional team, you've got a Frankenstein's monster that makes even opening the file feel like a Herculean task.

> 👉 **BIM lesson** Federating lets you collaborate quickly and make adjustments with ease. Merging may seem like a shortcut, but it can turn into a heavy, error-prone monster. Best for those who just want a single model... but beware of the bloated file! 😬

To **federate** in Bosai:

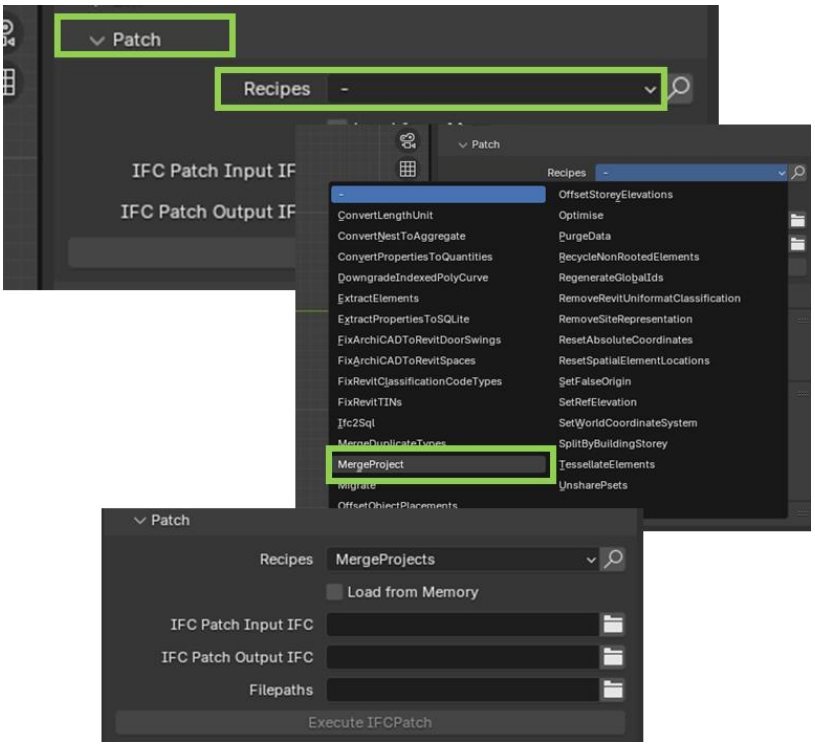
In the **Project Overview** tab, in the **Project Setup** drop-down, use the **Link tool**, which allows you to combine and integrate multiple IFC models into a single workspace, making federation and coordination between different parts of the project a breeze.



To **merge**, here things get complicated, just a little:

You have to go to the **Quality and Coodination tab**, go to the Patch drop-down, choose from the Recipes: **MergeProject drop-down**. At this point it is important to be clear about which file we want to merge the ifc into, which if you select Load from Memory will use the model you are working with, if you want another one choose IFC Patch Input IFC.

We generate a new file that we have to indicate the path, as well as the name, that you don't forget to put .ifc. And then you select the files you want to merge into filepaths... You press the little button and that's it.



Data and Element Extraction (WIP)

Generate 2D documents (WIP)

QTO (Quantity Take-Off) (WIP).

Working with large models (WIP)

CONCLUSION: DID YOU MAKE IT? TIME TO CELEBRATE WITH A COFFEE AND YOUR PERFECTLY DONE BIM MODEL!

And there you have it! Managing IFC doesn't have to be intimidating. With these tools and tips, you can take control of your models and work like a true BonsaiBIM pro. The secret? Stay organized, filter out what you don't need, and remember: if you get stuck, there's a tutorial for everything.