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Title: BIM model with Cype Architecture

1 – Aims

The objectives of this CYPE Architectural tutorial are as follows:

- To know a CAD software to create three-dimensional models of buildings.
- To detect and correct interferences in the model.
- To identify and correctly enter structural elements.
- To configure and introduce architectural elements and furniture at will.

2 – Learning methodology.

The teacher will give an explanation about BIM modelling.

Students will read this tutorial and will watch the videos.

Students will follow the steps shown in videos 1, 2, 3 and 4:

- Knowing the interface and operation of CYPE Architecture.
- Introduction of structural elements and collision detection.
- Introduction of architectural elements.
- Introduction of furniture.

3 – Tutorial duration.

The practice described in this tutorial will be carried out in a computer classroom.

It will last 4 teaching hours.

4 – Necessary teaching recourses

Computer room with PCs with internet access.

Required software: CYPE Architecture, AutoCAD

Hardware required: Pcs

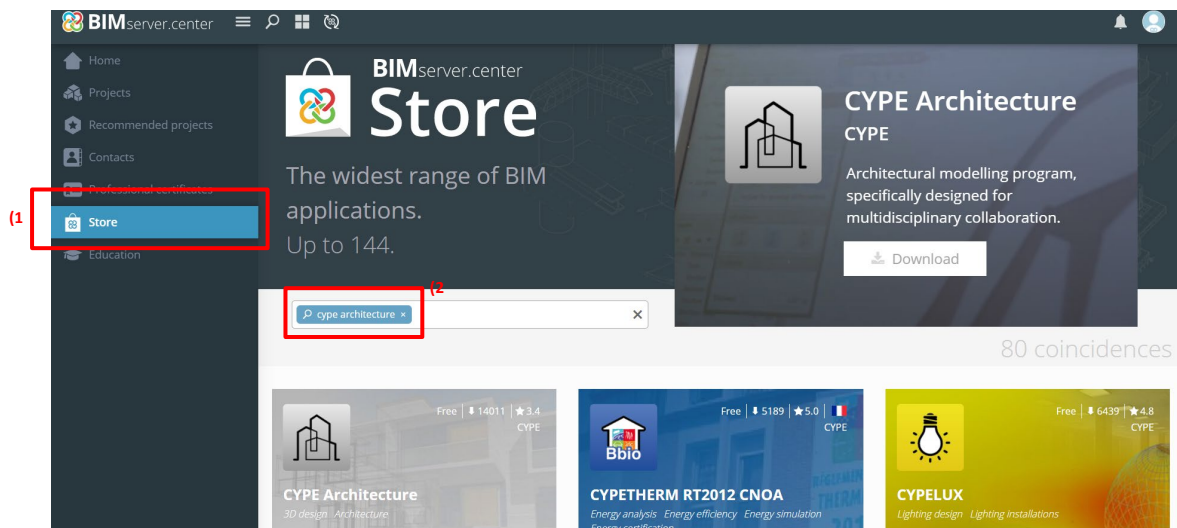
5 – Contents & tutorial

5.1 – Introduction

With this tutorial we are going to try to create a 3D model of a small 2-storey house using CYPE-Architecture. This software is designed for multidisciplinary collaboration using an Open BIM workflow by mean of BIMserver.center platform.

5.2 – Software installation

First, go to the URL of the BIMserver.center platform: <https://bimserver.center/> and create an account. Once you were logged in, go to the Store⁽¹⁾ tab and look for **CYPE-Architecture**⁽²⁾. Download and install it.



5.3 – New job

Open CYPE Architecture to create a new project: **File > New**. In the pop-up window *New job*, select name and folder location for the files. Then click *Accept*

Quick tip: It is recommended to dedicate a folder to save the project, because it generates different files and subfolders.

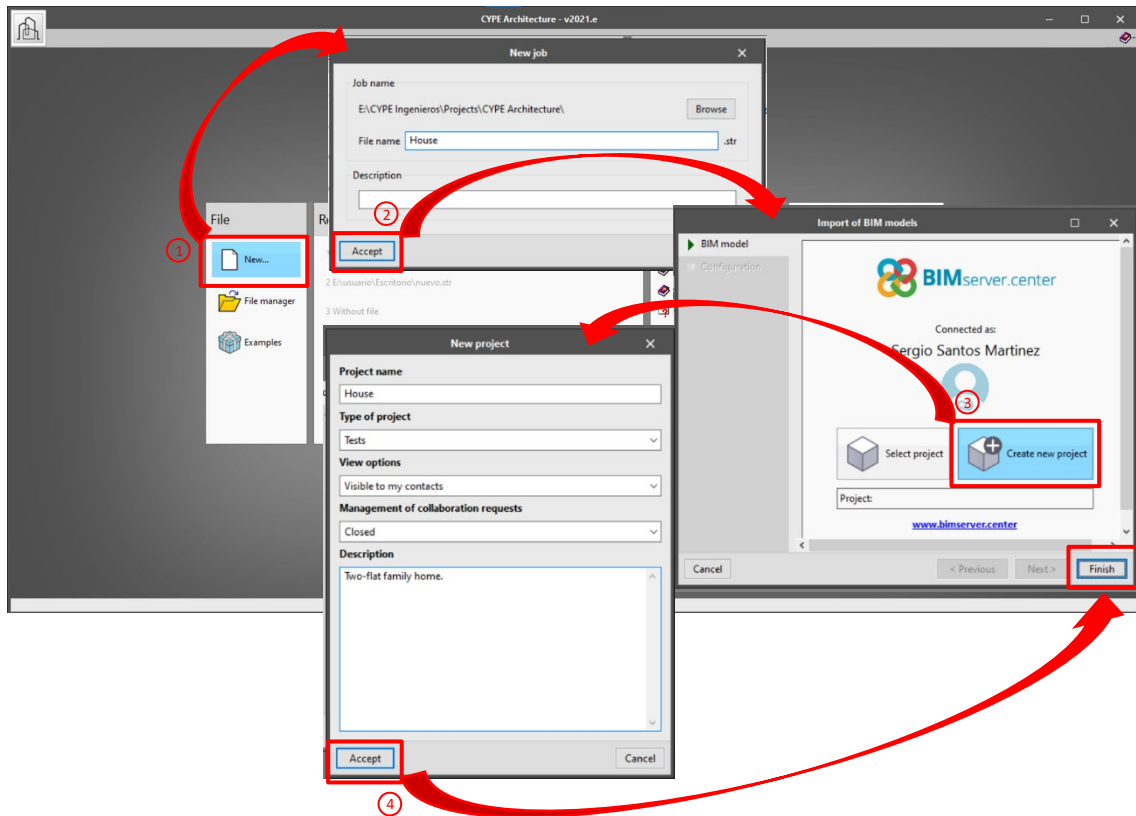
Bellow *Import of BIM models*, select *Create new project*. Where it says (*New project*), you must name the project, choose its type, choose view options, select a management of collaboration request and enter one description.

Type of Project > Tests

View options > Visible to my contacts

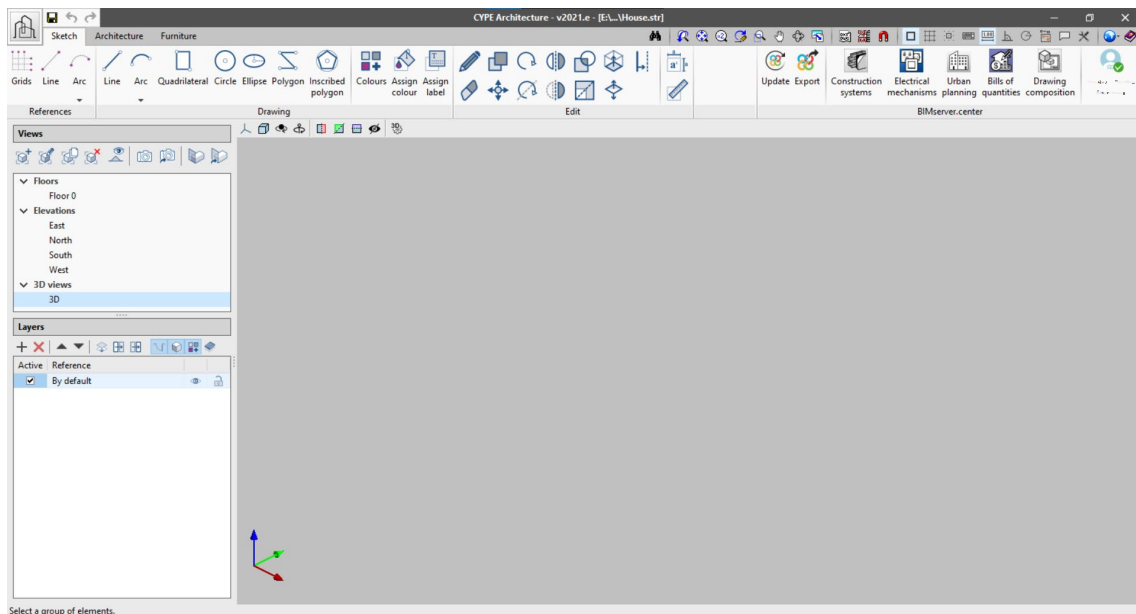
Management of collaboration requests > Closed

Accept and Finish.



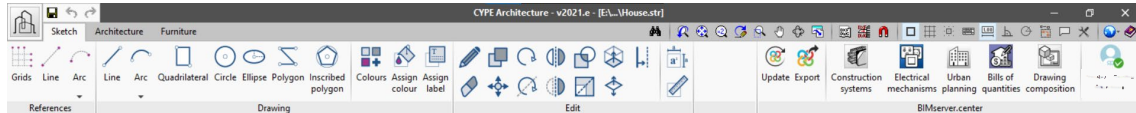
5.4 – Beginning

CYPE Architecture's interface is minimalist and intuitive. This way it helps new users to quickly adapt to this ecosystem.



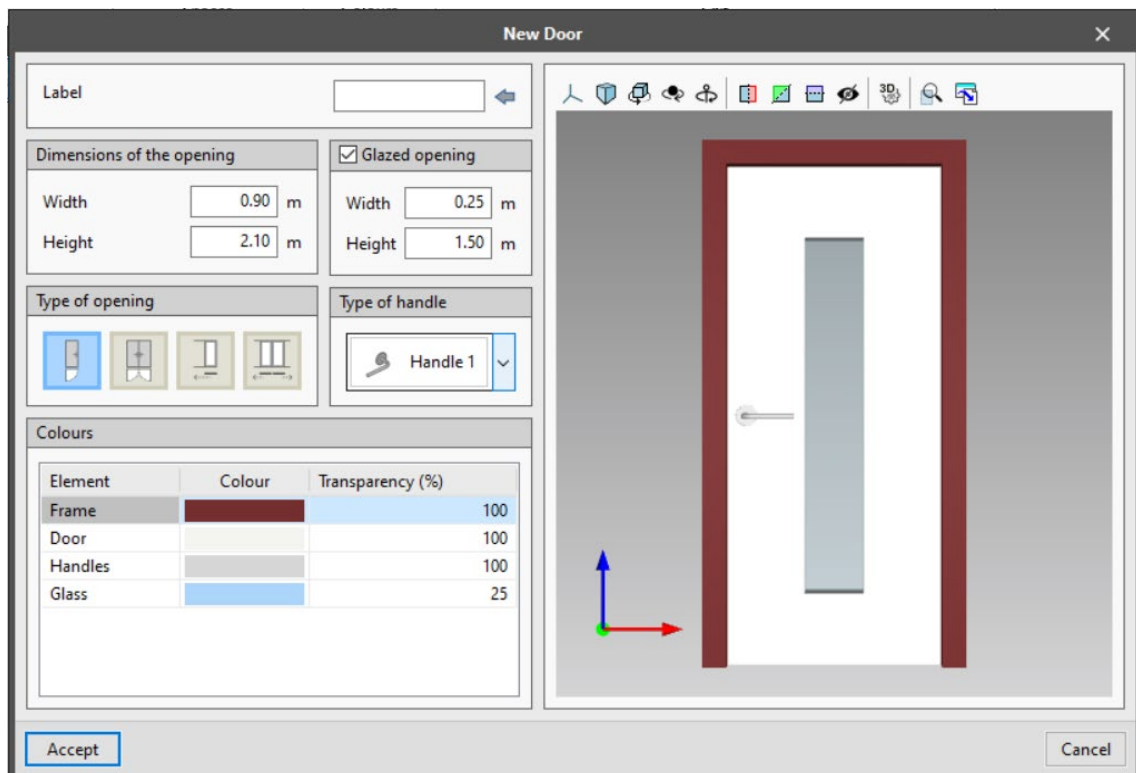
Below the Title Bar we have the Menu and icons bar, with three options to choose: *Sketch*, *Architecture* and *Furniture*. These are the tools to create, edit and insert elements. You also have other bars with several options to select.

- **Sketch:** using traditional tools, complex shapes can be drawn and created in 2 or 3 dimensions to develop the conceptual design



- **Architecture:** It allows you to insert the structural and architectural elements to create the model. Such as walls, columns, beams, floors, doors, windows, among others. With this tab, you can use the previously created sketch to assign an element or an architectural entity to each of its parts. **You also** can directly start to build your BIM model from a CAD template.

Architectural elements can be customized. For example, for a door you can choose its dimensions, type of opening and handle, glazed opening and the colour of its parts.



- Furniture:** it allows you to insert the furniture in a 3D model to get an idea of the distribution of the spaces. This way you can give the desired finishing touches to get plans or renderings. These pieces of furniture are able to interact with other programs within the Open BIM workflow of BIMserver center.

Like architectural elements, each furniture has its own customization options.



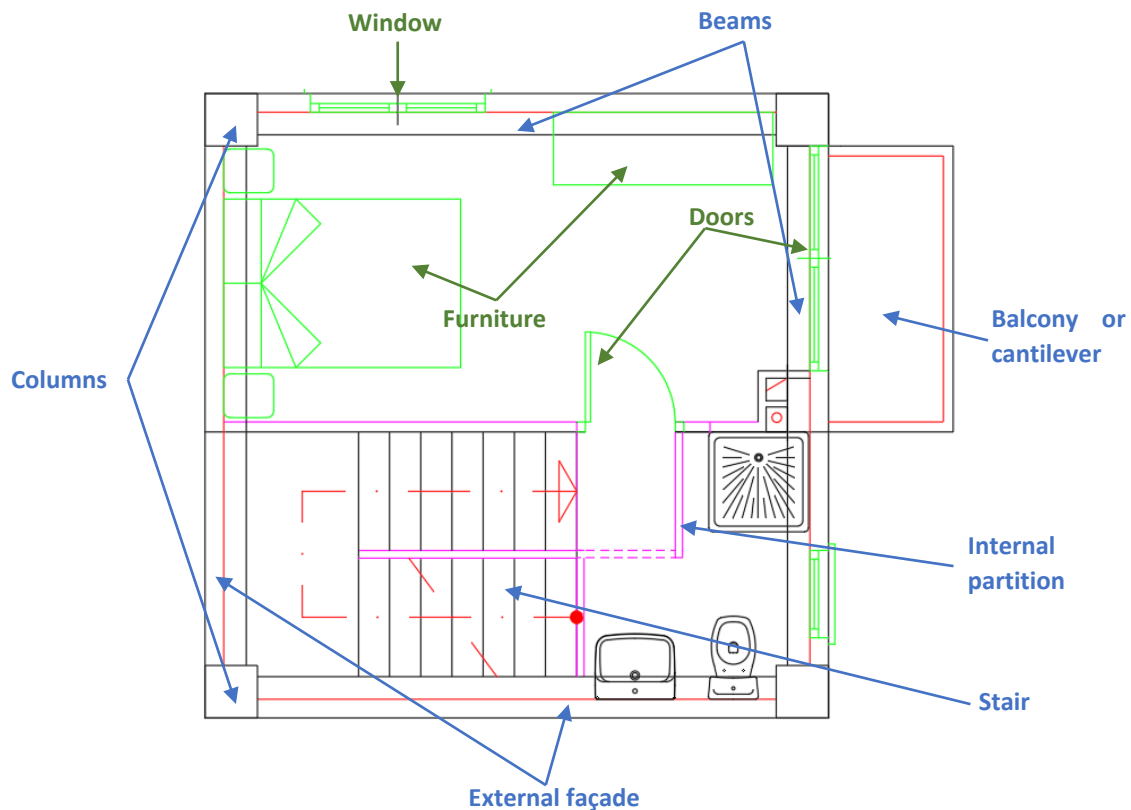
5.5 – Task to do

Using the CYPE-Architecture software, we are going to create a 3D model of a small 2-storey house. The house that this example shows.



For solving this task, three house plans are supplied in dwg format. These plans correspond to the ground floor, first floor and roof. They can be downloaded from Section: *Files to use in this tutorial*.

Let's get acquainted with the elements of the architectural plans of the ground floor.



The dimensions of the structural elements are as follows:

Element	Dimensions (m)	
	Width	Thickness
Beams	0.33	0.35
Columns	0.42	0.42
External façade	0.15	-
Internal partition 1	0.08	-
Internal partition 2	0.06	-
Slab	-	0.25

For doors and windows:

Element	Dimensions (m)	
	Width	Height
Front door	0.95	2.10
Kitchen door	0.72	2.03
Bathroom door	0.72	2.03
Room door	0.72	2.03
Balcony door	1.75	2.20
Windows	1.40	1.60
Bathroom window	0.70	1.20

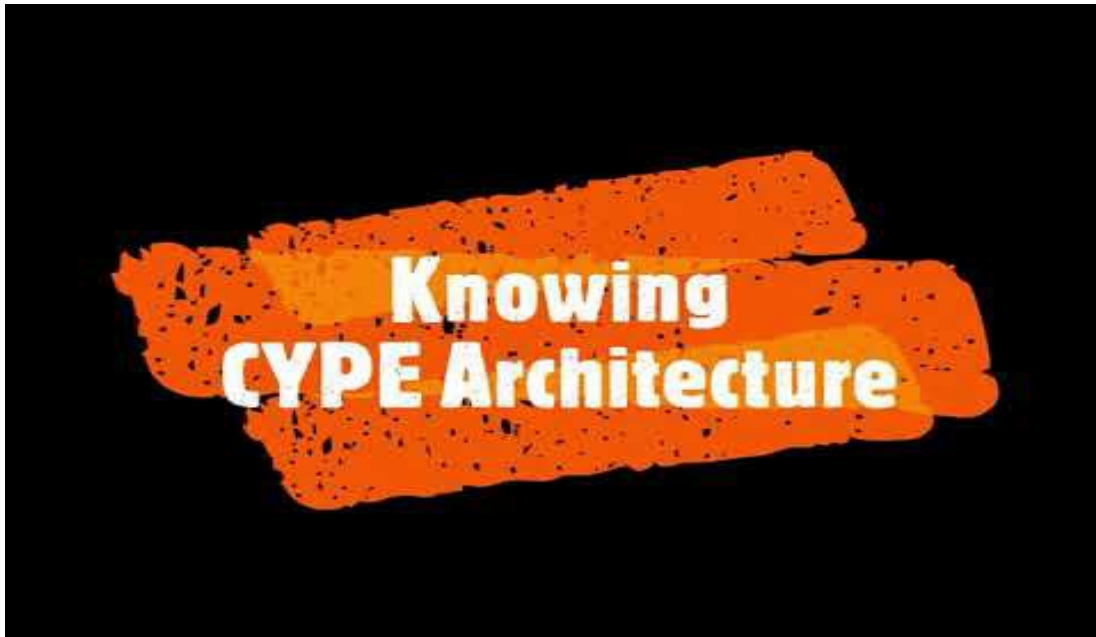
The whole process is shown in 4 short videos. The goal is to guide the student by means of these videos so that she or he can create the model.



5.5.1 – Video 1

The goal of this video is to get acquainted with the program. Therefore, we make a travel through the whole interface showing all necessary tools to create a project.

<https://www.youtube.com/watch?v=wY4vFSWrwso>



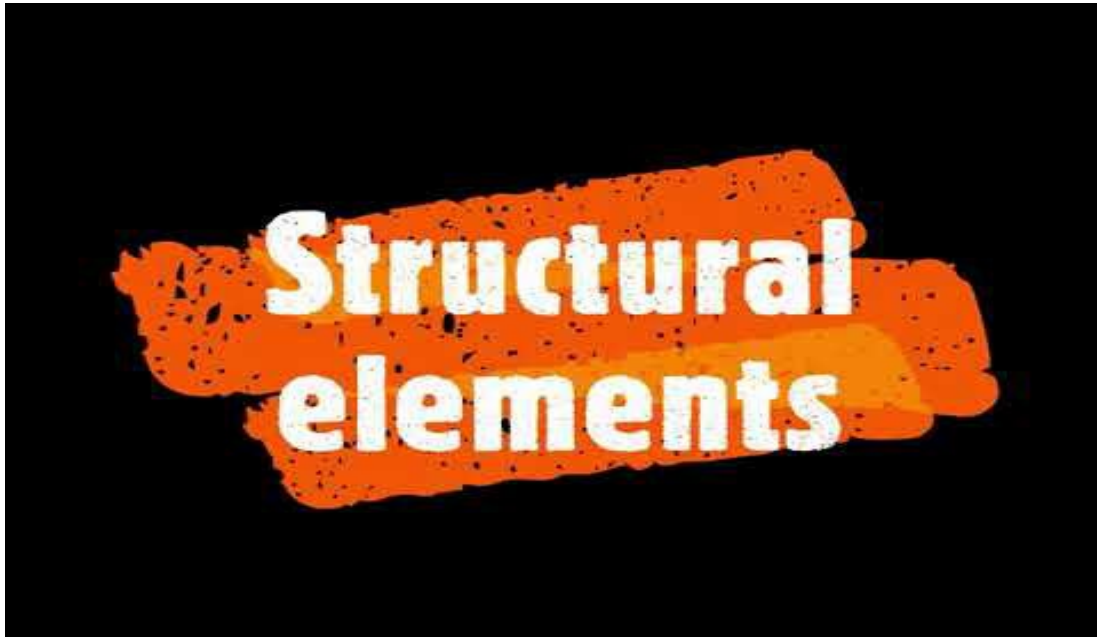
5.5.2 – Video 2

Here we can put into practice what we have learned in Video 1. I mean, all what is related to the views, inserting templates and creation of new floors. From there, we will enter all structural elements of the house (beams, columns, slabs, walls).

We will also try to create and assign layers to the different elements that make up the house. Similarly, we will try to visualize and resolve interference between these elements.



<https://www.youtube.com/watch?v=ZZfRsjo-9Q8>



5.5.3 – Video 3

In this video we will insert the architectural elements (doors and windows) to the structural model. The stair will be modelled too.

https://www.youtube.com/watch?v=3RI_mrlBacA





5.5.4 – Video 4

This video is completely based in the furniture.

<https://www.youtube.com/watch?v=qwtalcmRrt0>



6 – Deliverables

To assess the achievement of the practice, students will write a report of 4 pages maximum.

In this report, the student will explain the steps taken in practice, the difficulties **found** and the decisions taken. The report will be illustrated with photographs of structural elements, architectural elements, and furniture.

7 – What we have learned

The structural and architectural elements that make up a building.

To create a three-dimensional model. And BIM model.

To detect and correct collisions.

To insert and configure furniture.



8 – Files to use in this tutorial

Drawings of each floor in DWG format

Architectural model in CYPE Architecture format

Model in IFC format