Erasmus+ Project 2022-1-NO01-KA220-HED-000087893

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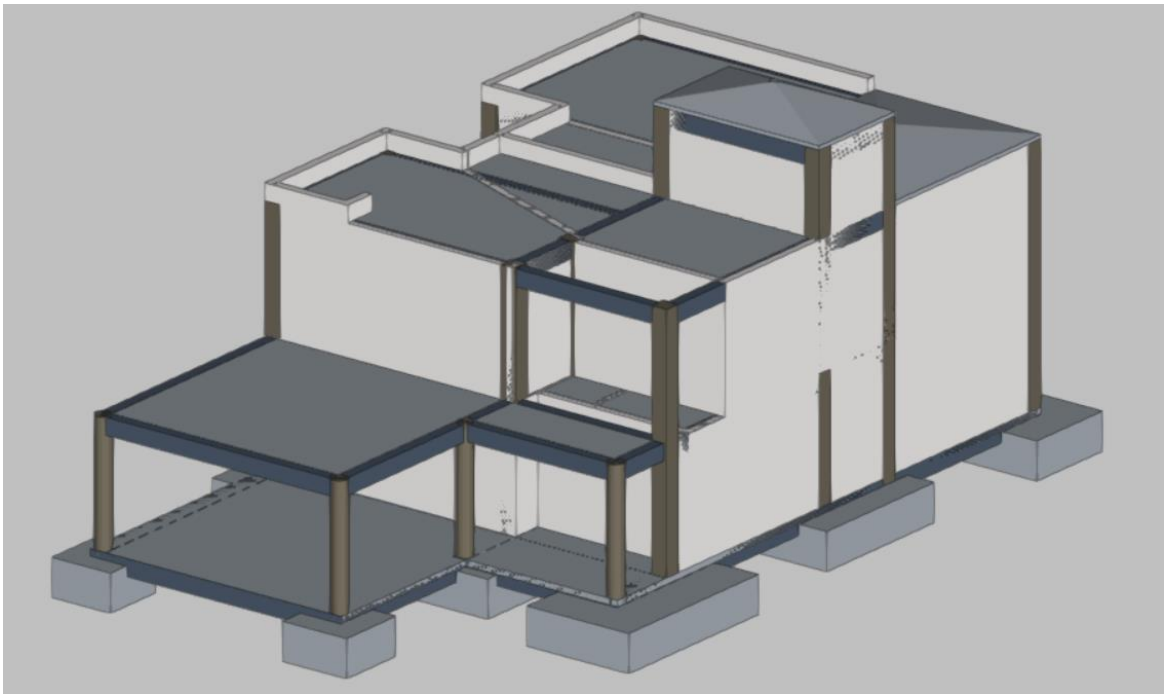
BIM-LCA Construction Project

Title: Single-family house with Cype Architecture



1 – Aims

The objectives of this tutorial are as follows:

- Knowing about a CAD software to create three-dimensional models of buildings.
- Learning how to create floors and import drawing templates.
- Identifying and correctly entering the structural elements.
- Configuring and introducing architectural elements.

2 - Learning methodology

The teacher will give an explanation about modelling of single family house with Cype Architecture in about 30 minutes.

Students will read this tutorial and follow the steps shown in the tutorial, namely:

- Knowing the interface and operation of Cype Architecture.
- Introduction of structural elements.
- Introduction of architectural elements

In order to evaluate the success of the application, students will prepare a report on the steps taken in practice, difficulties faced and decisions taken.

3 - Tutorial duration

The implementation described in this tutorial will be carried out through the Cype Architecture software.

3 lesson hours are suitable for this training.

4 – Necessary teaching recourses

Computer room with PCs with internet access.

Required software: Cype Architectur

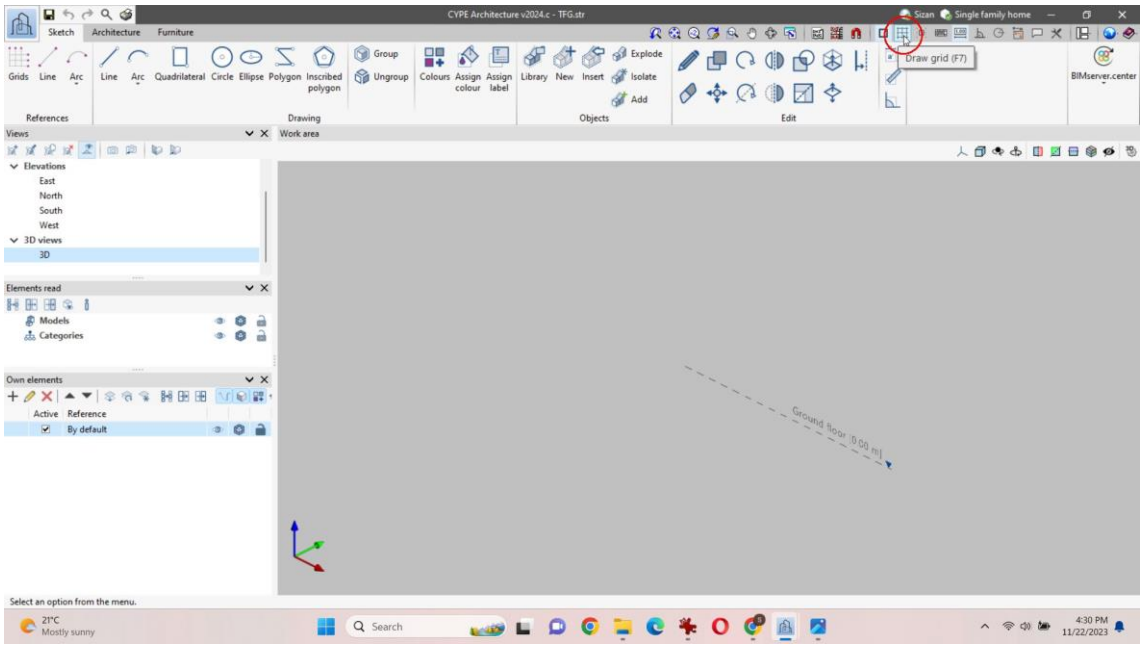
5 - Contents & tutorial

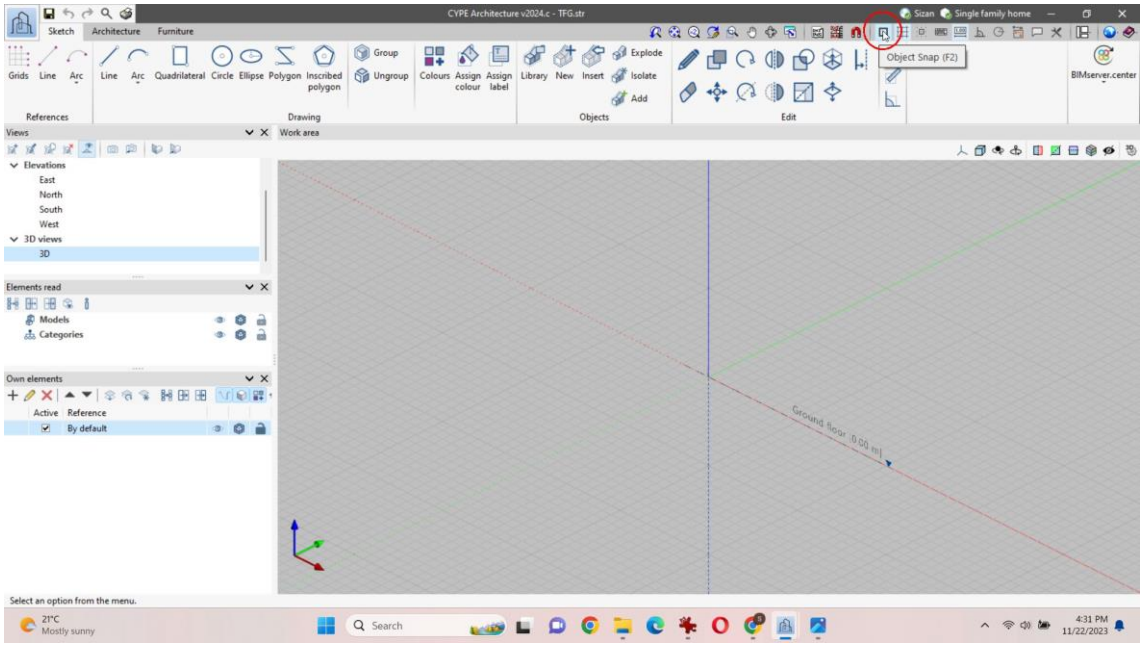
5.1 Tutorial

CYPE Architecture can be used to design the model of the building. The building is a two storeyed family house. The step by step process of modelling the building is described below:

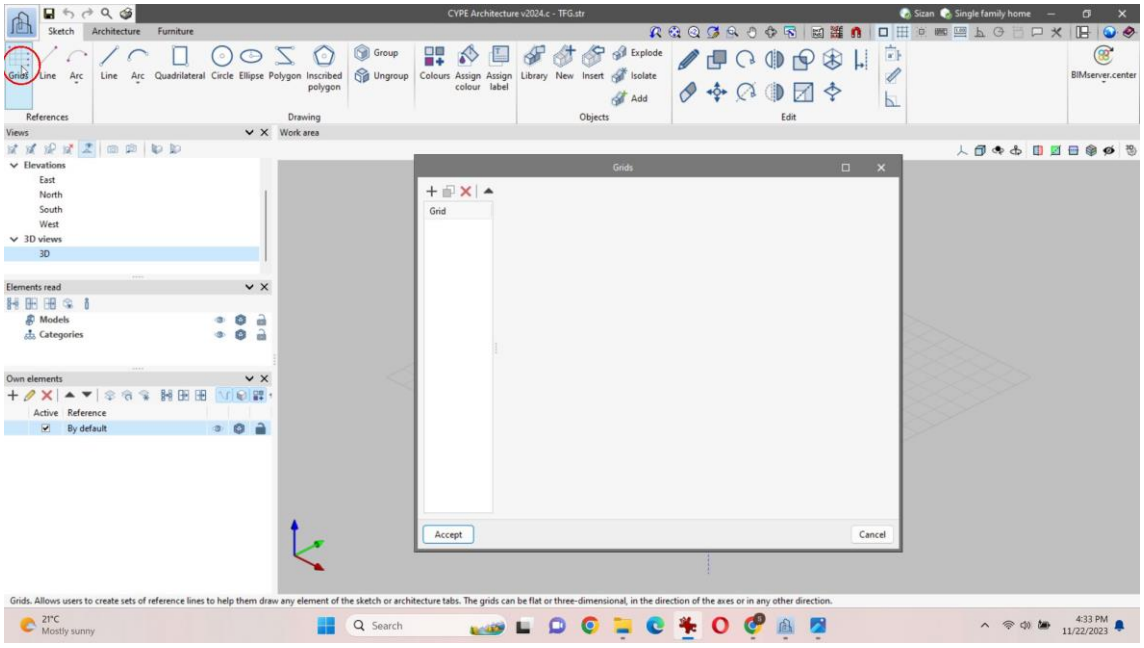
5.1.1. Model design

Firstly, it is recommended to activate the drawing grids and object snap feature for design convenience.

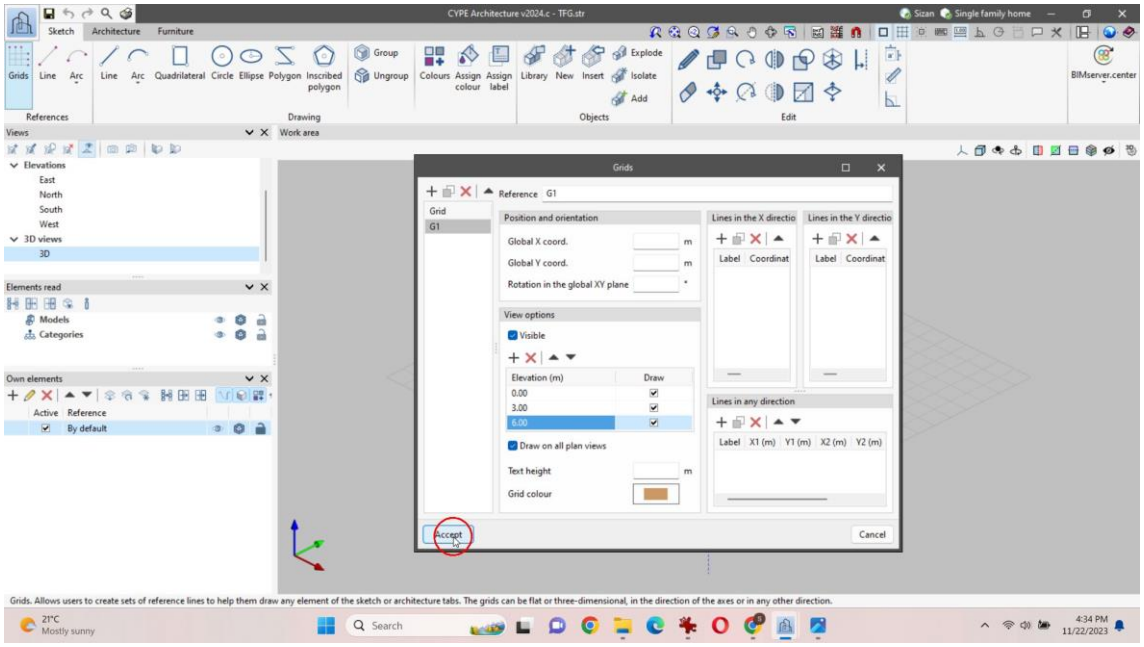




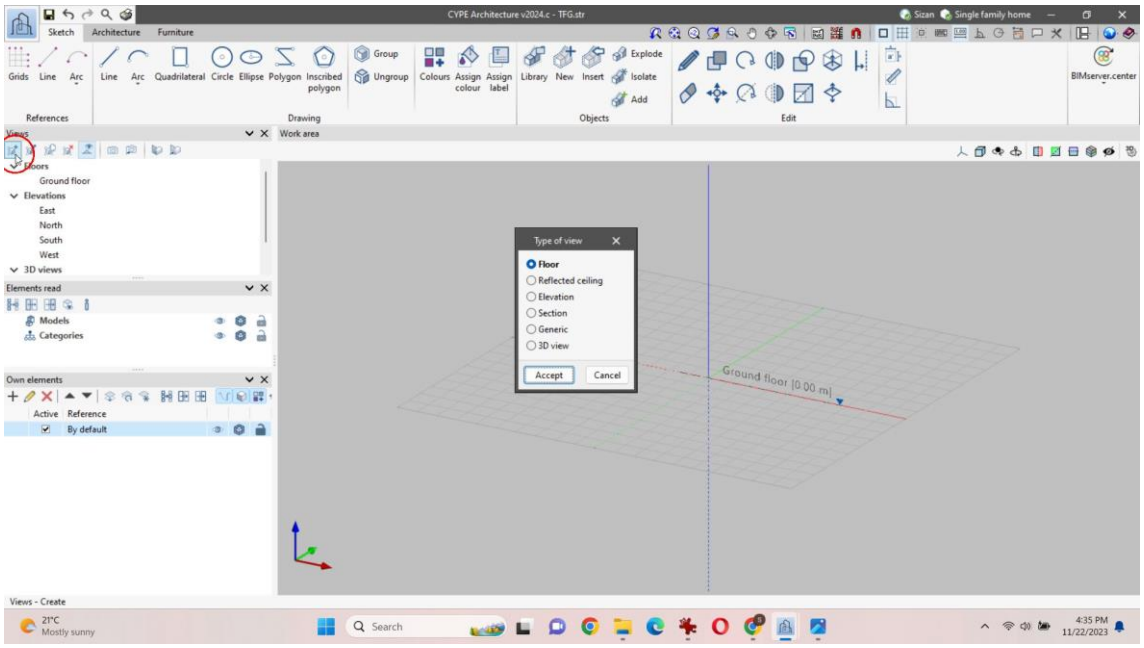
This icons allows you to create grids.



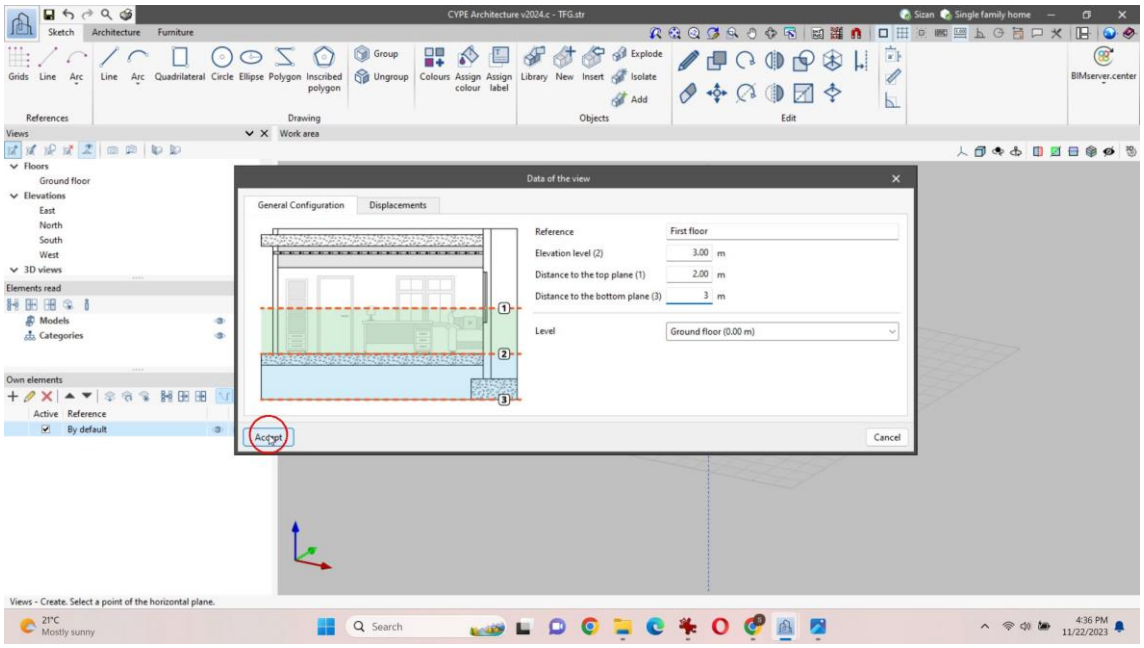
You can use the '*+*' icon to create grids as shown in the image below and click *Accept*.

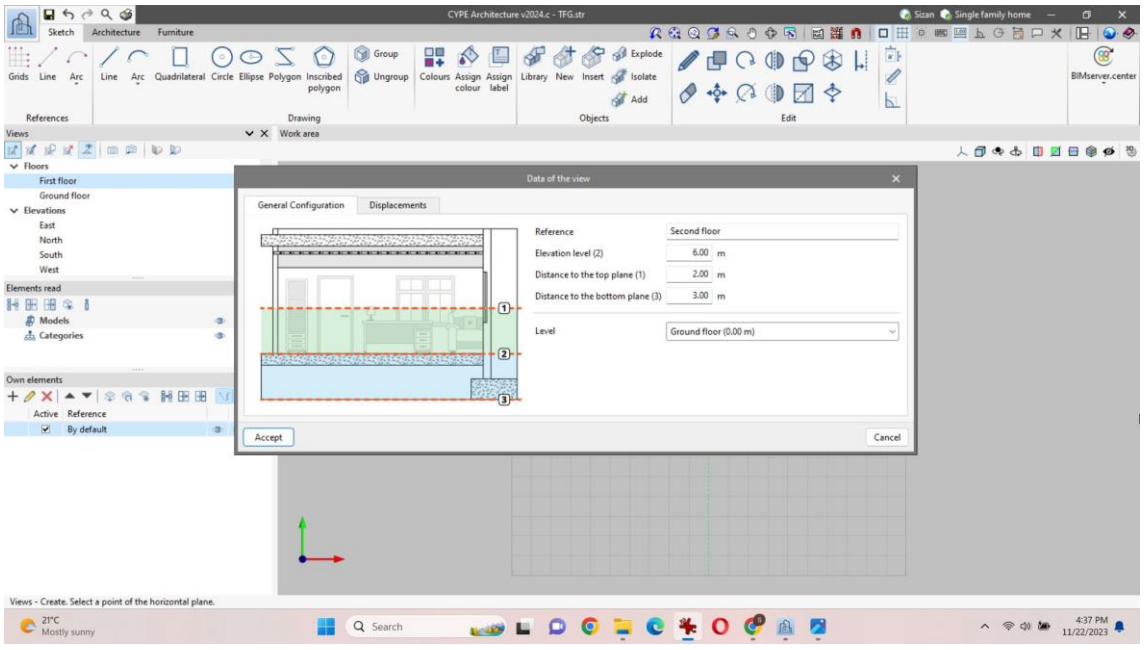


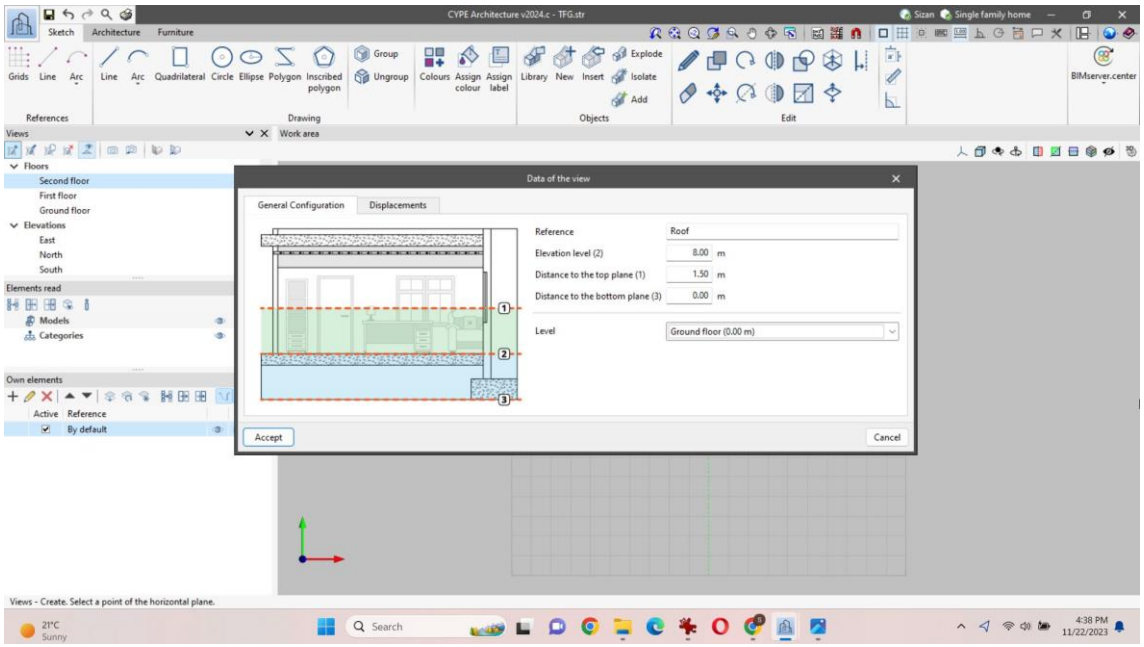
Use this app icon to create a new floor and its elevation levels.



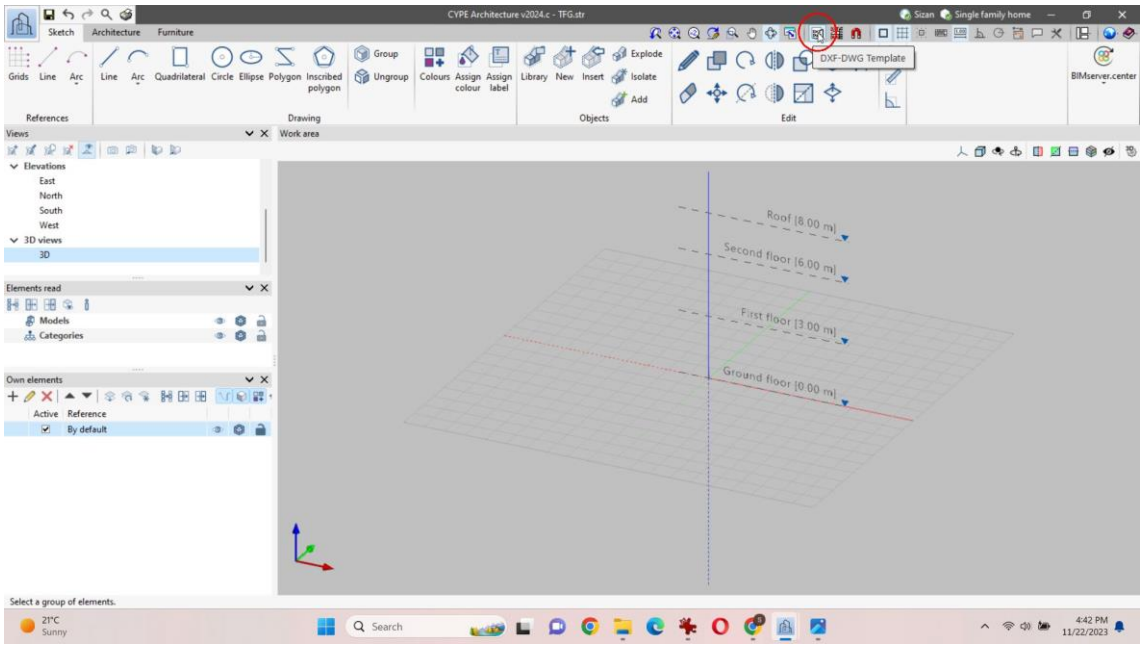
By inserting the correct elevation levels, you can create the first floor, second floor and roof.



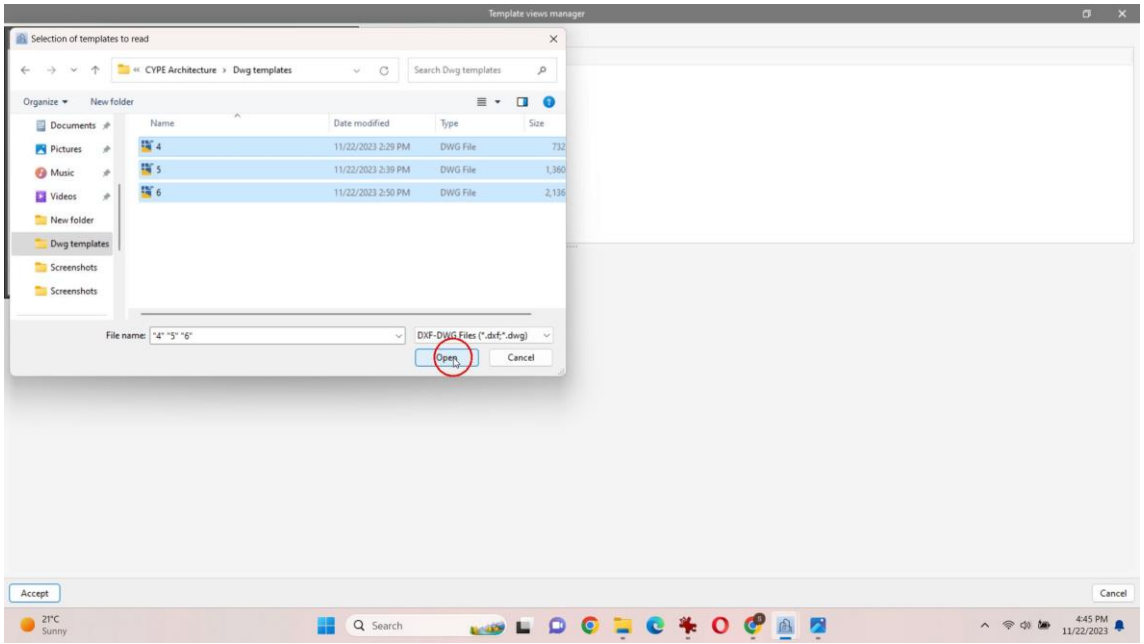




In CYPE Architecture, you can import drawing templates for precise modelling. Click this icon to insert drawing templates.



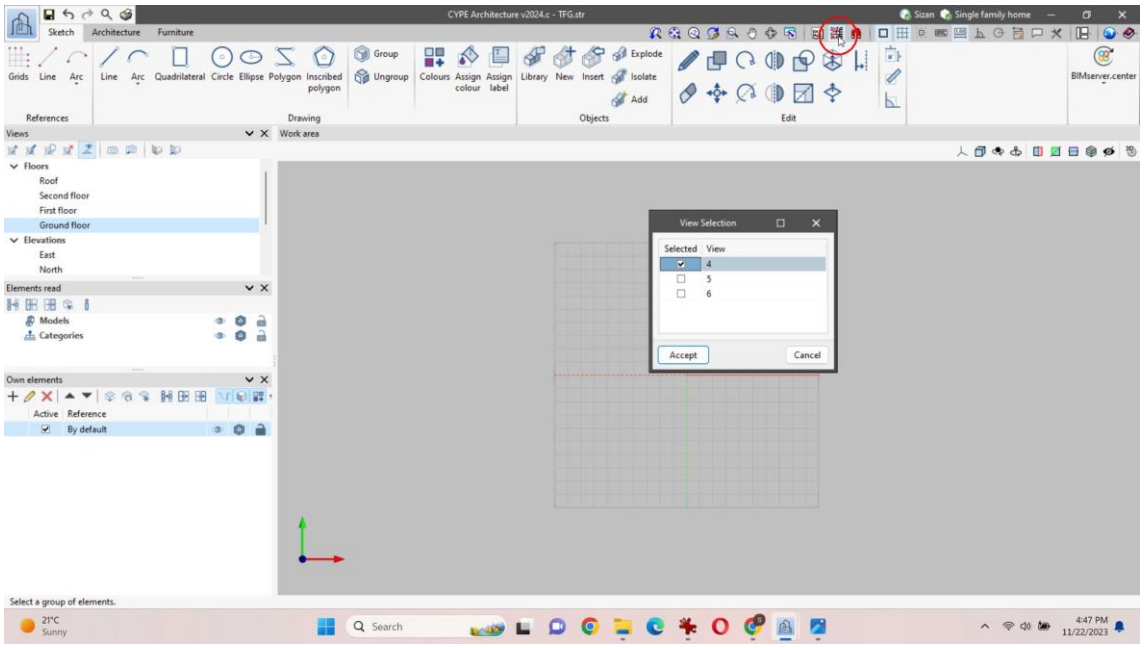
Select the templates and click *Open* then *Accept.*

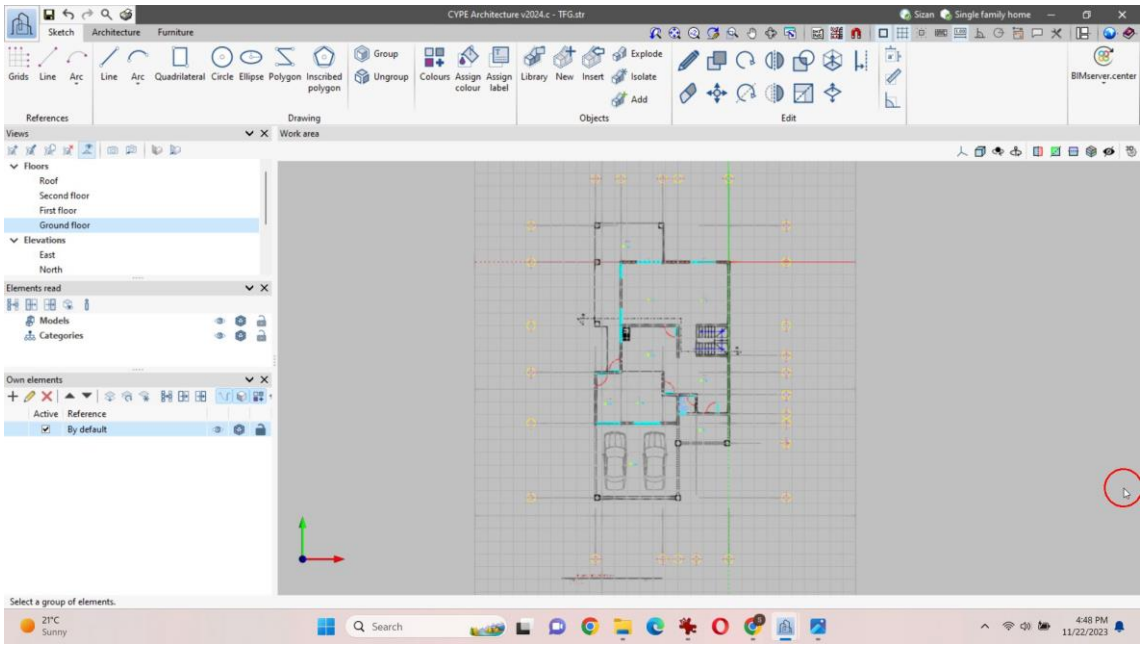


5.1.2. Ground floor

5.1.2.1 Inserting template

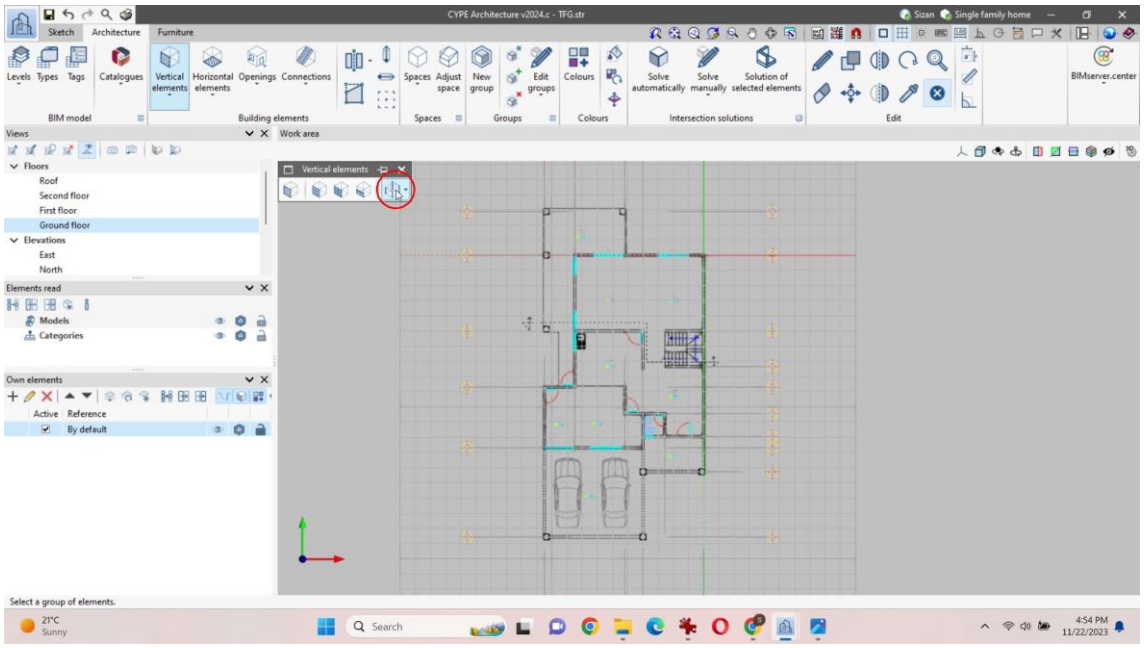
Firstly, Select *Ground floor* and then import the template as shown in the image below. Template '4' is the floor plan of the ground floor.



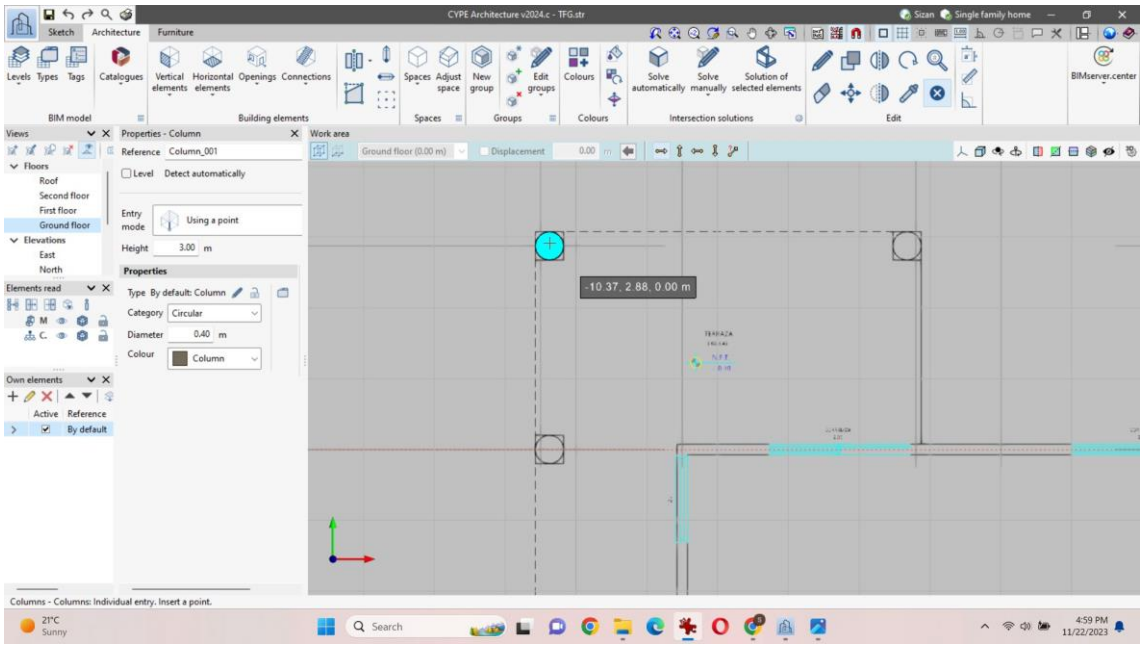


5.1.2.2 Columns

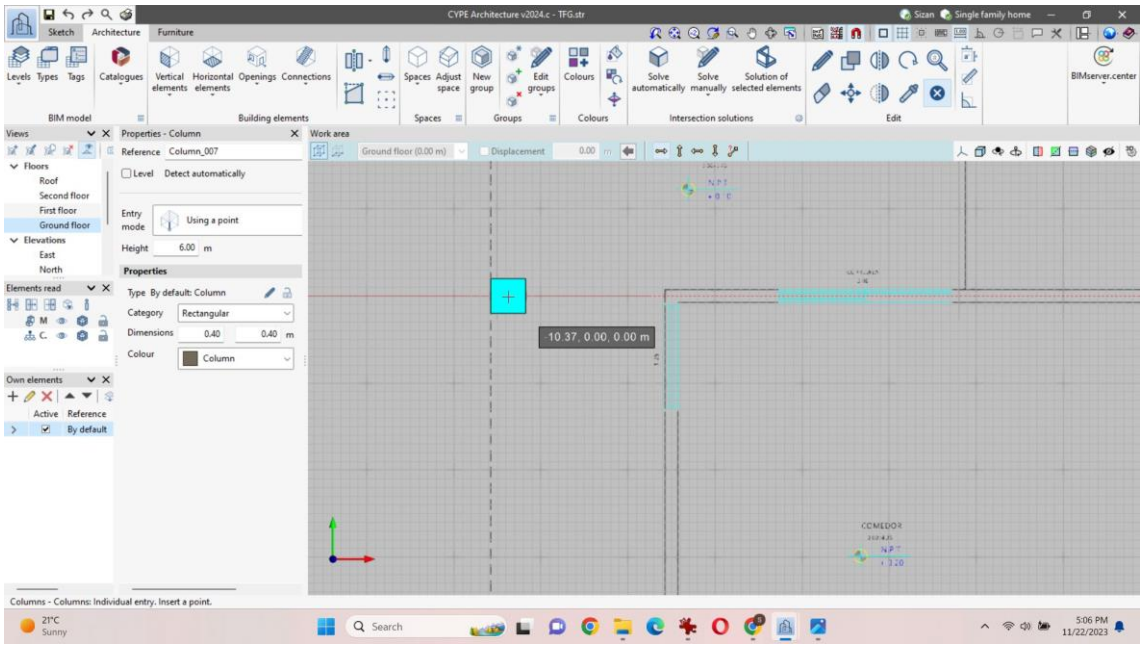
To draw columns, select *Vertical elements* the click the icon as shown in image below.



For circular columns, enter the respective category and column size. Then, place the columns as per the template. Make sure to right-click at the end to complete the task.

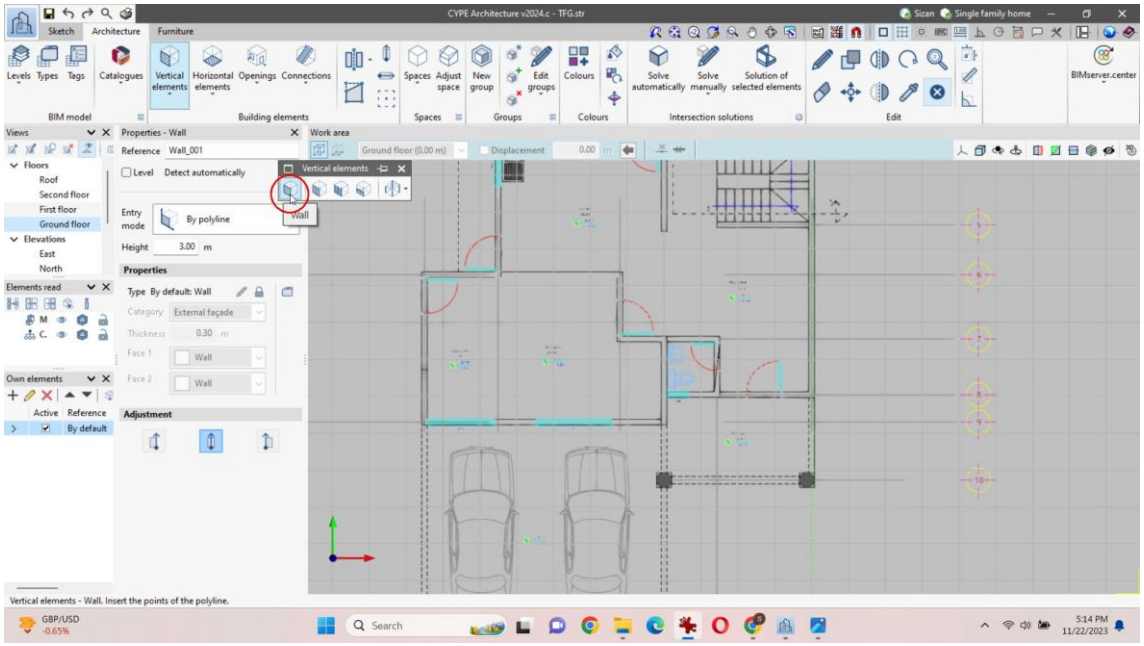


Proceed similarly for rectangular columns.

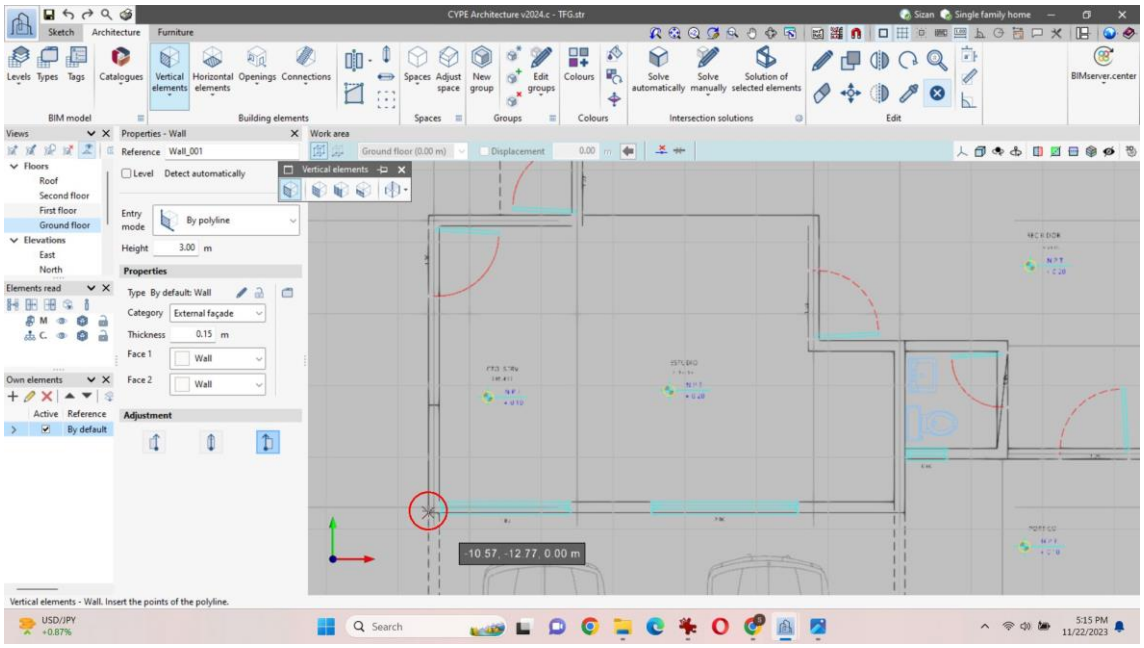


5.1.2.3 Walls

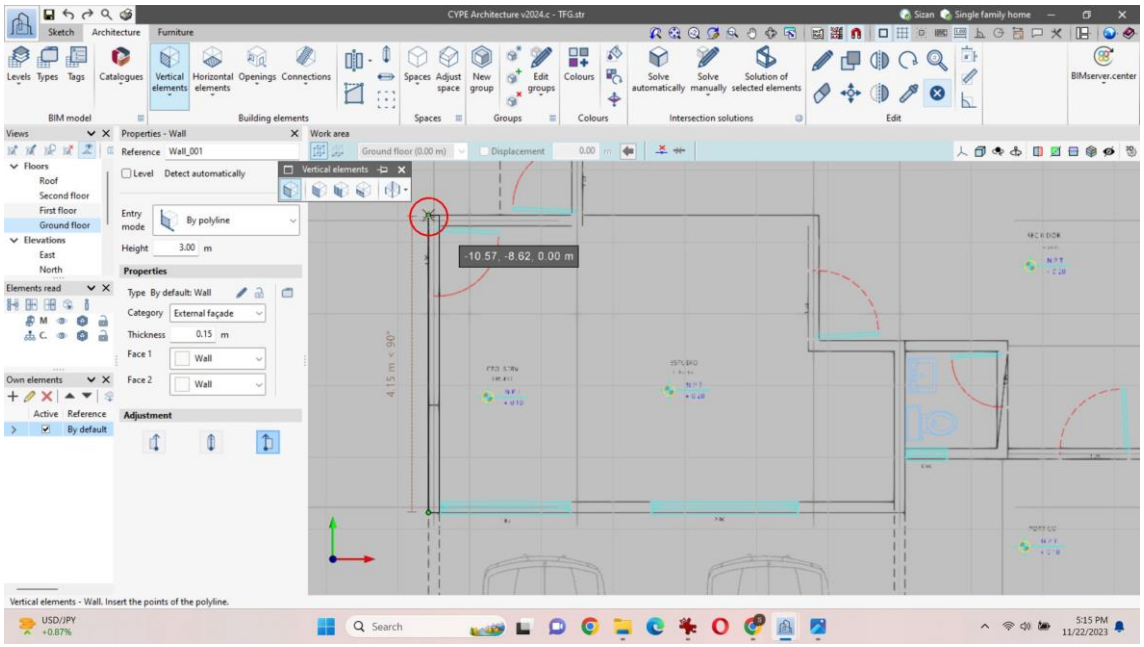
Walls can be drawn as shown in figure below.



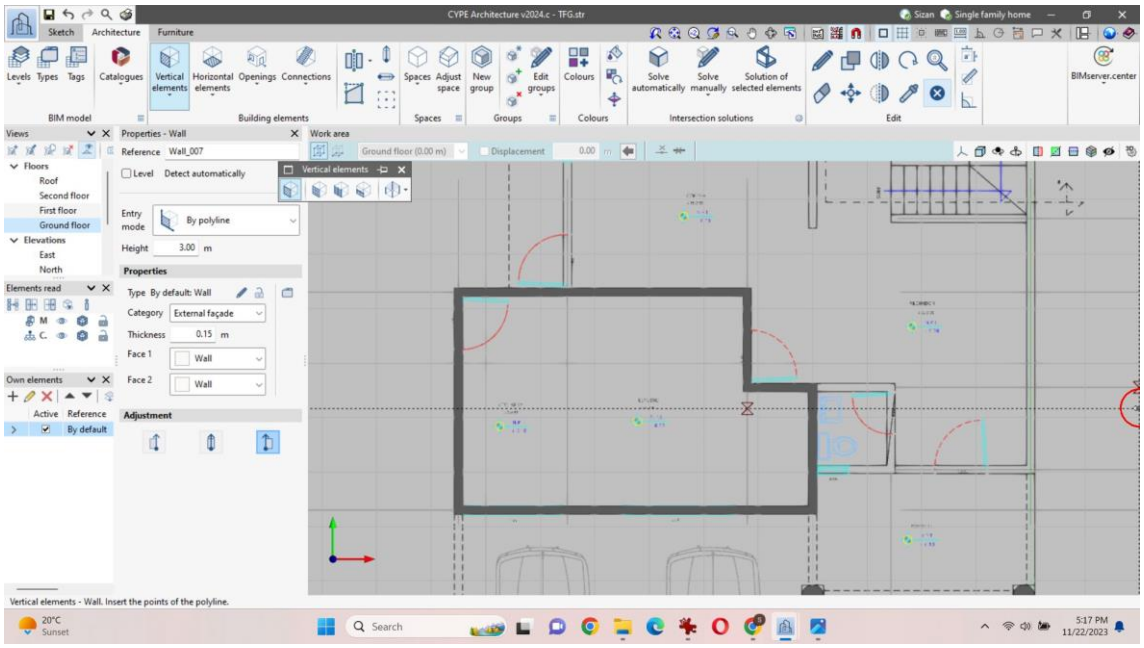
Enter the dimensions of the wall and then click the first point.



Then, click the end point. Make sure that the adjustment is set as per design.

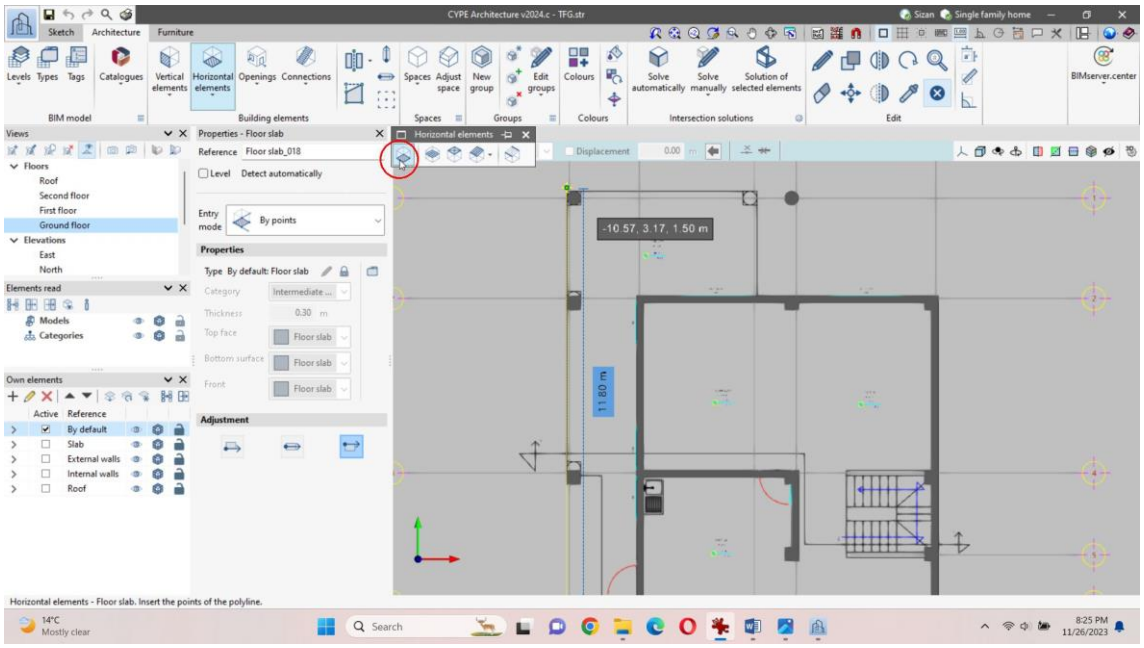


All the other walls can be drawn by following the same procedure as shown above.

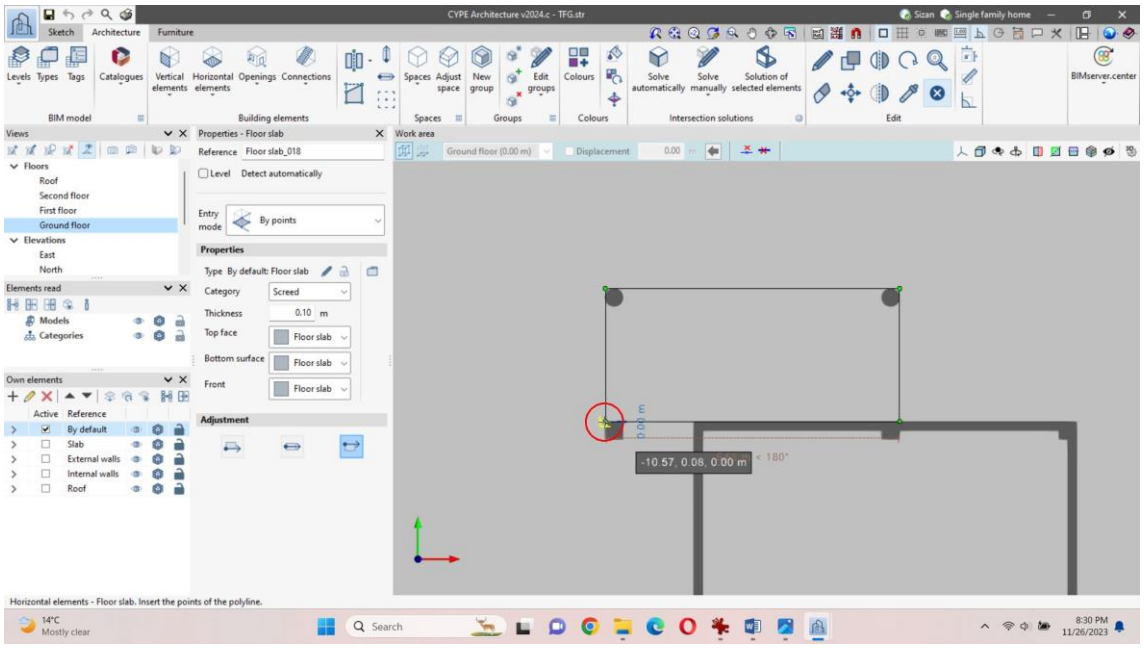


5.1.2.4 Slab

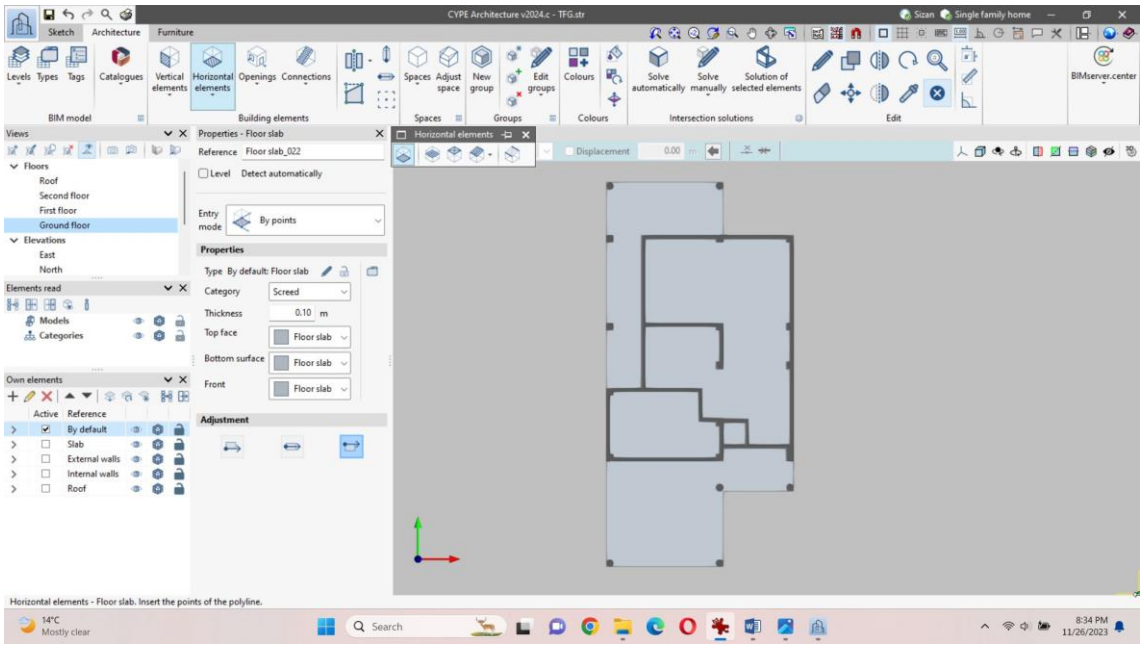
To draw slab, proceed as shown in the image below.



Enter the thickness of slab and its category. Click the corners of the slab and then right-click at the end to draw the slab.



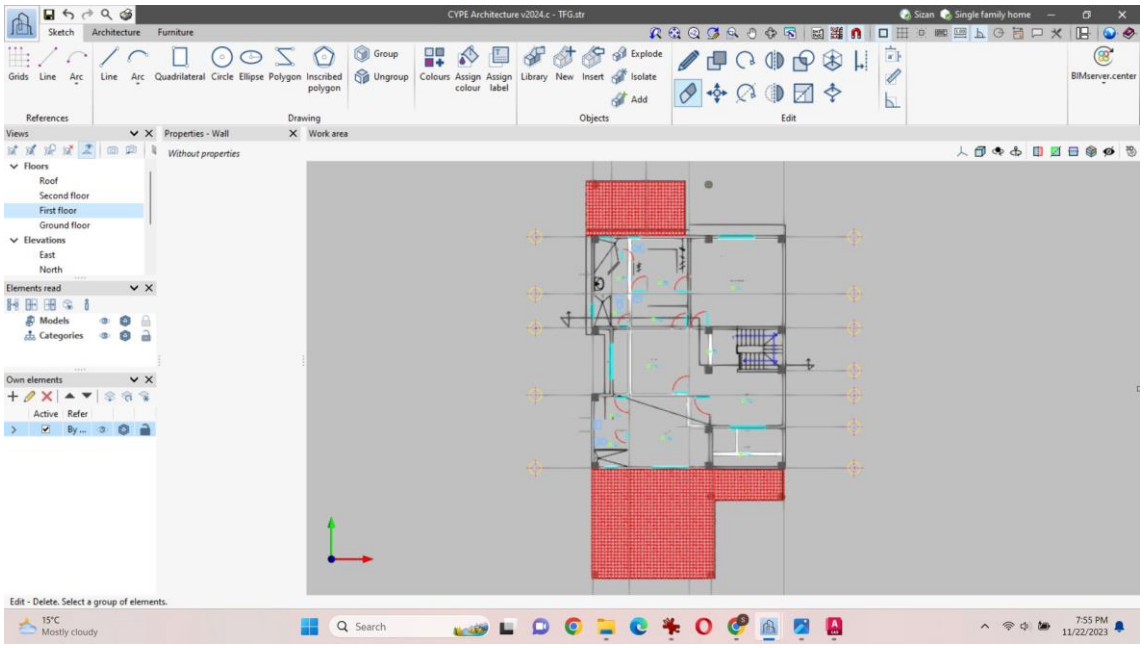
All the other columns, walls and slabs can be drawn similarly using the procedure as shown above. In this way, the ground floor design can be completed.



5.1.3 First floor

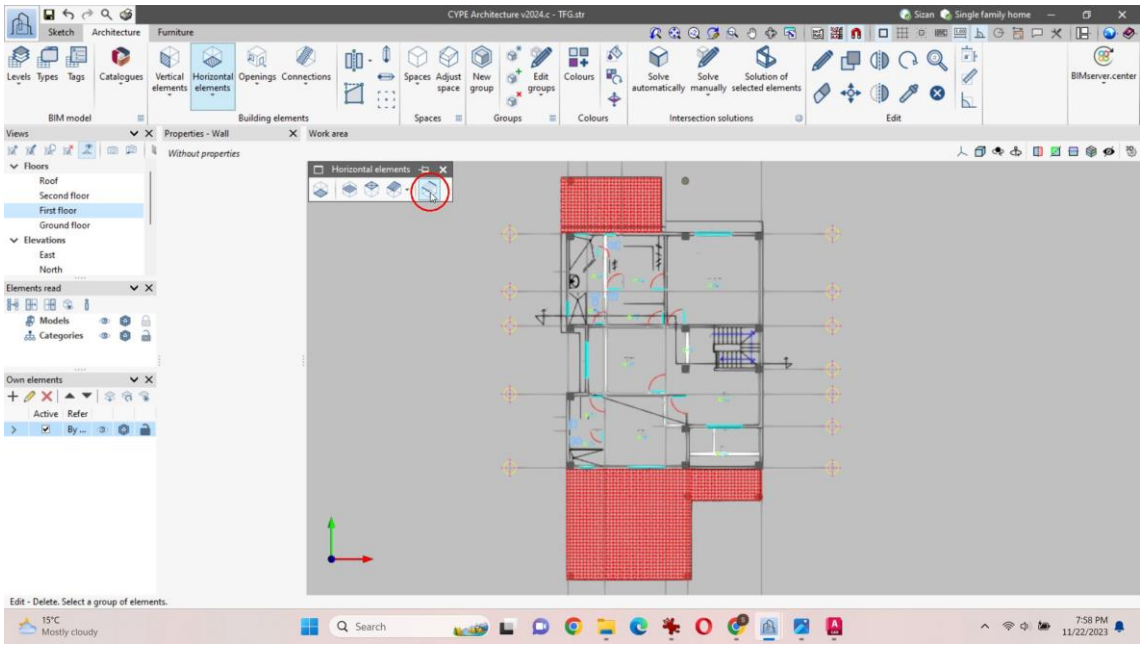
5.1.3.1 Inserting template

Insert the drawing template for first floor using the same process as that for the ground floor.

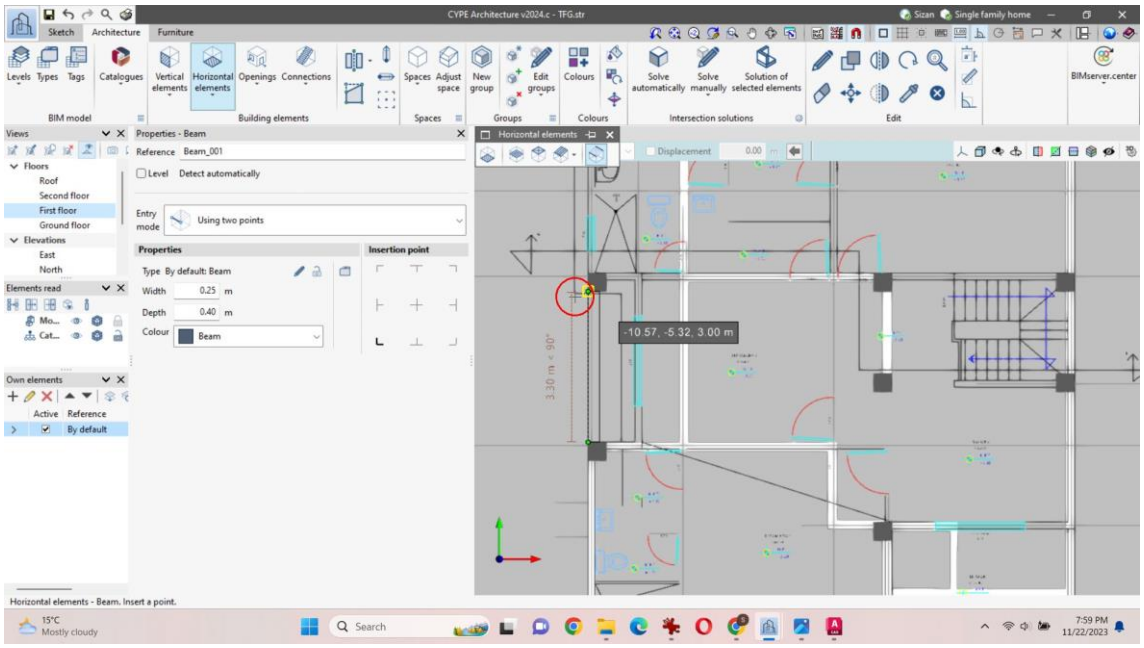


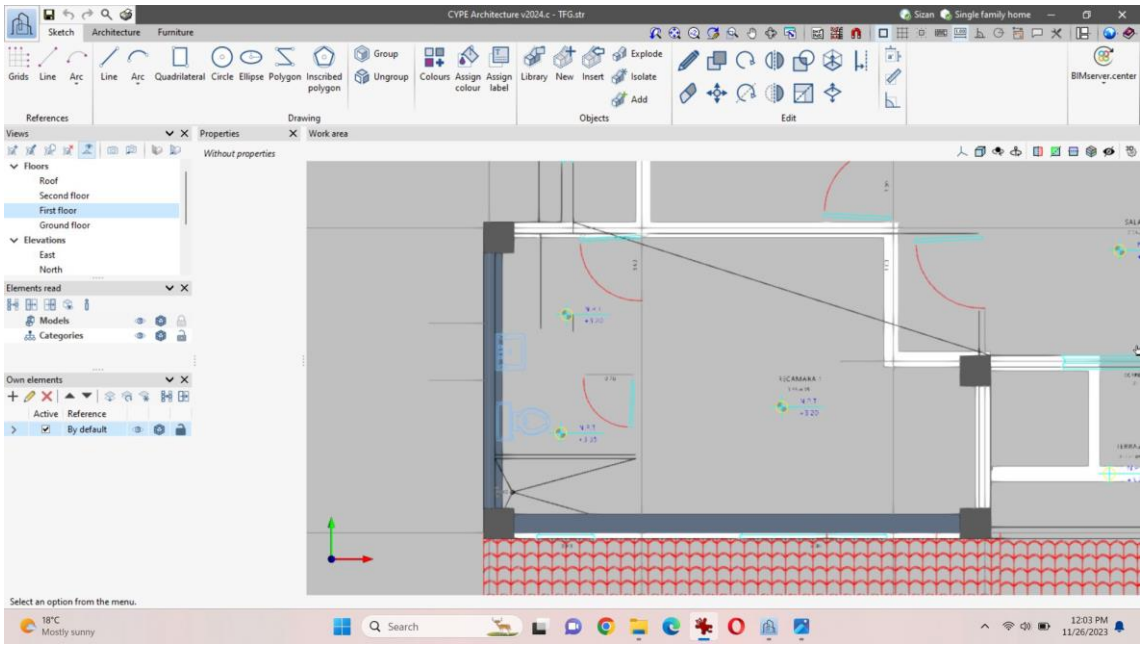
5.1.3.2 Beams

To draw beams, Select *Horizontal elements* and click the icon as shown below.

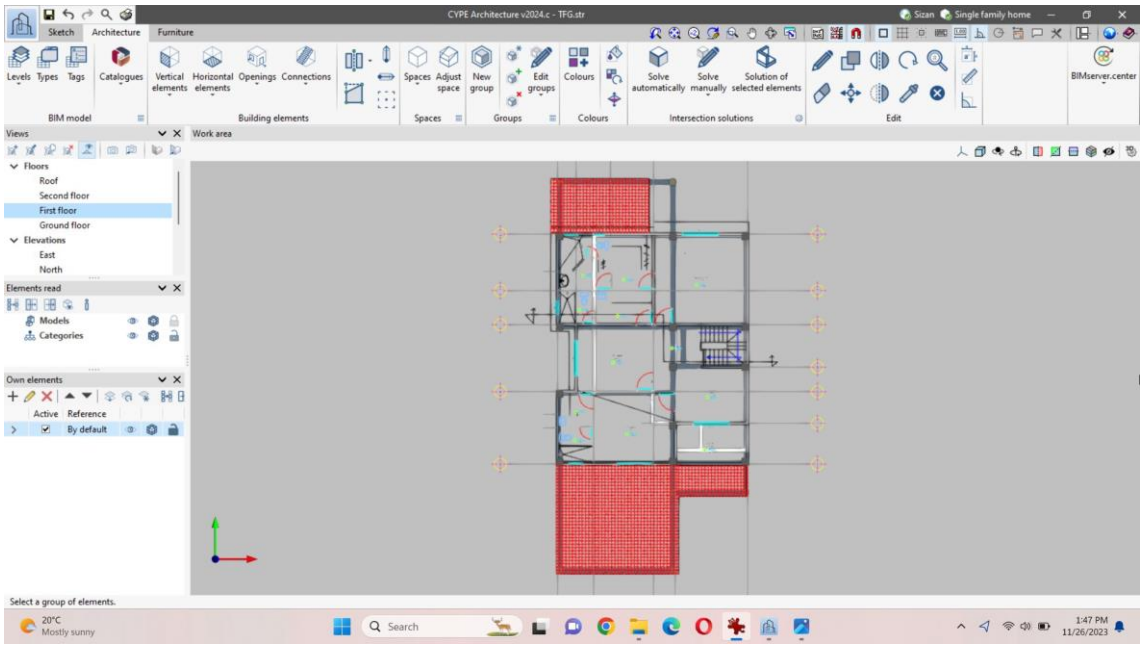


Enter the width and depth of the beam and make sure that the insertion point is adjusted as per the beam orientation. Then, Select the end points of the beam and right-click.



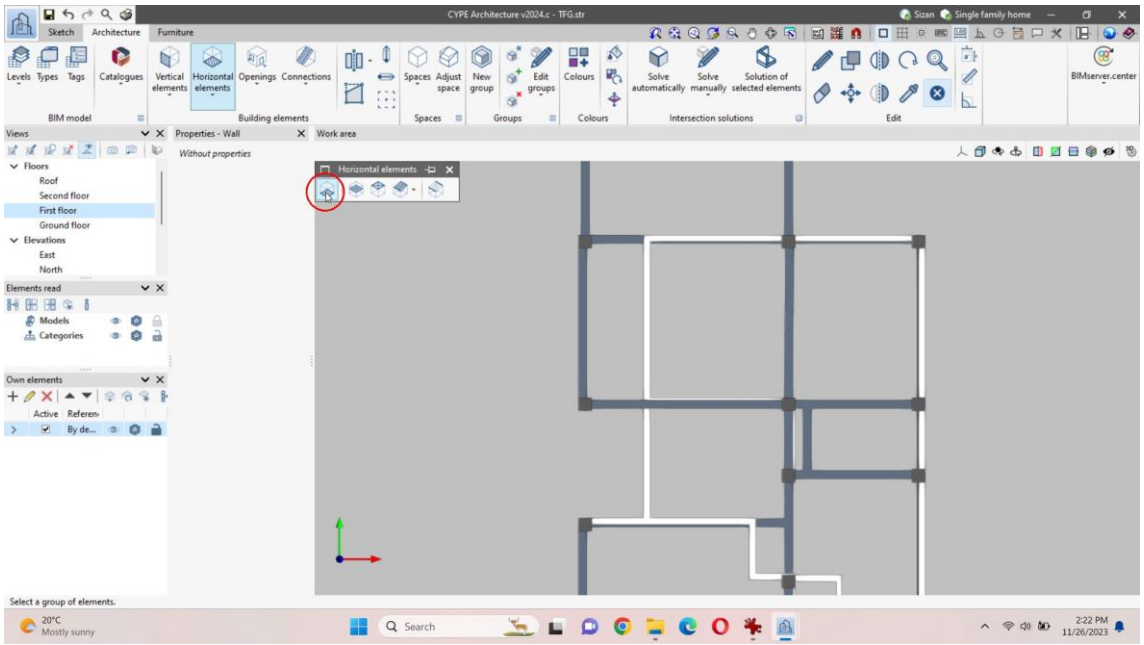


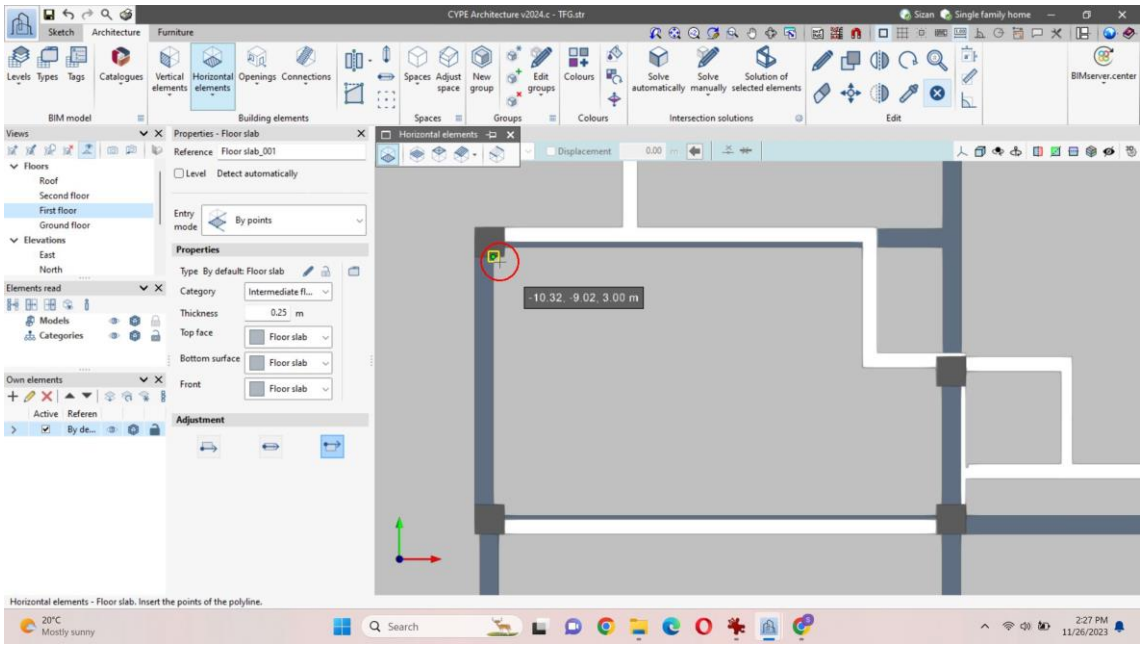
All the other beams can be drawn similarly.

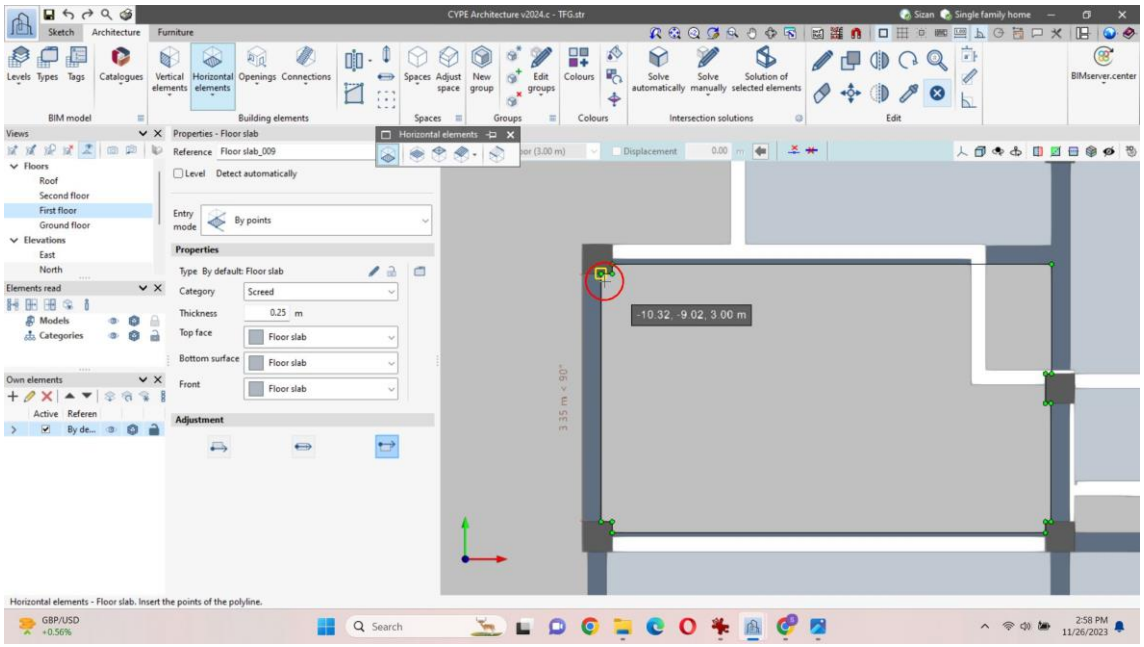


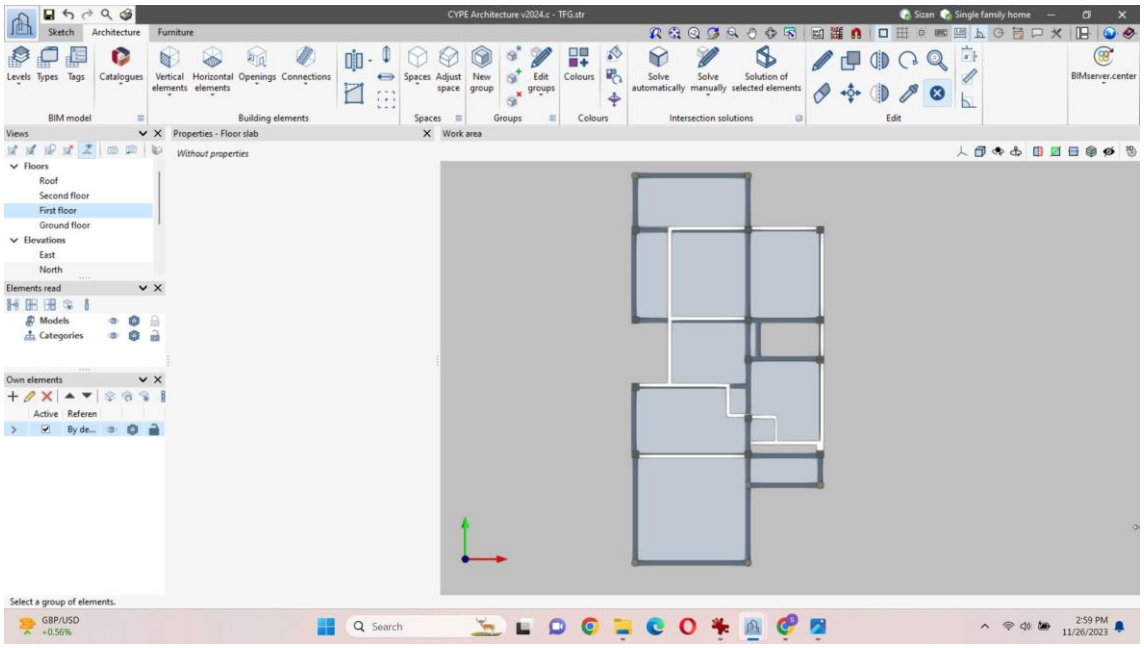
5.1.3.3 Slab

The procedure for drawing slab is also similar to that for the ground floor. 'Intermediate floor slab' is selected in the category instead of 'Screed'.



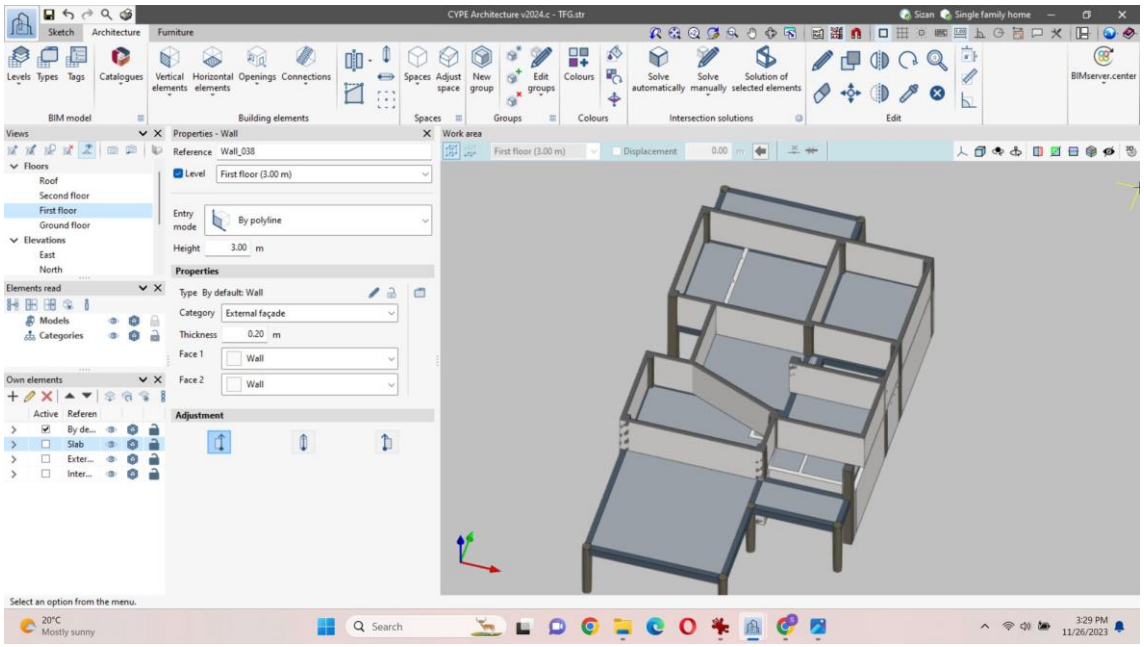

CYPE Architecture v2024.c - TFG.str
Sketch
Architecture
Furniture
Levels
Types
Tags
Catalogues
Vertical elements
Horizontal elements
Openings
Connections
Spaces
Adjust space
New group
Edit groups
Colours
Solve automatically
Solve manually
Solution of selected elements
BIMserver.center
BIM model
Building elements
Spaces
Groups
Intersection solutions
Edit
Properties - Floor slab
Reference
Floor slab_001
Level
Detect automatically
Entry mode
By points
Properties
Type By default: Floor slab
Category
Intermediate fl...
Thickness
0.25 m
Top face
Floor slab
Bottom surface
Floor slab
Front
Floor slab
Adjustment
Floors
Roof
Second floor
First floor
Ground floor
Elevations
East
North
-10.32, -9.02, 3.00 m
Horizontal elements - Floor slab. Insert the points of the polyline.


CYPE Architecture v2024.c - TFG.str
Sketch
Architecture
Furniture
Properties - Floor slab
Reference
Floor slab_009
Level
Detect automatically
Entry mode
By points
Properties
Type By default: Floor slab
Category
Screed
Thickness
0.25 m
Top face
Floor slab
Bottom surface
Floor slab
Front
Floor slab
Adjustment
-10.32, -9.02, 3.00 m
Horizontal elements - Floor slab. Insert the points of the polyline.



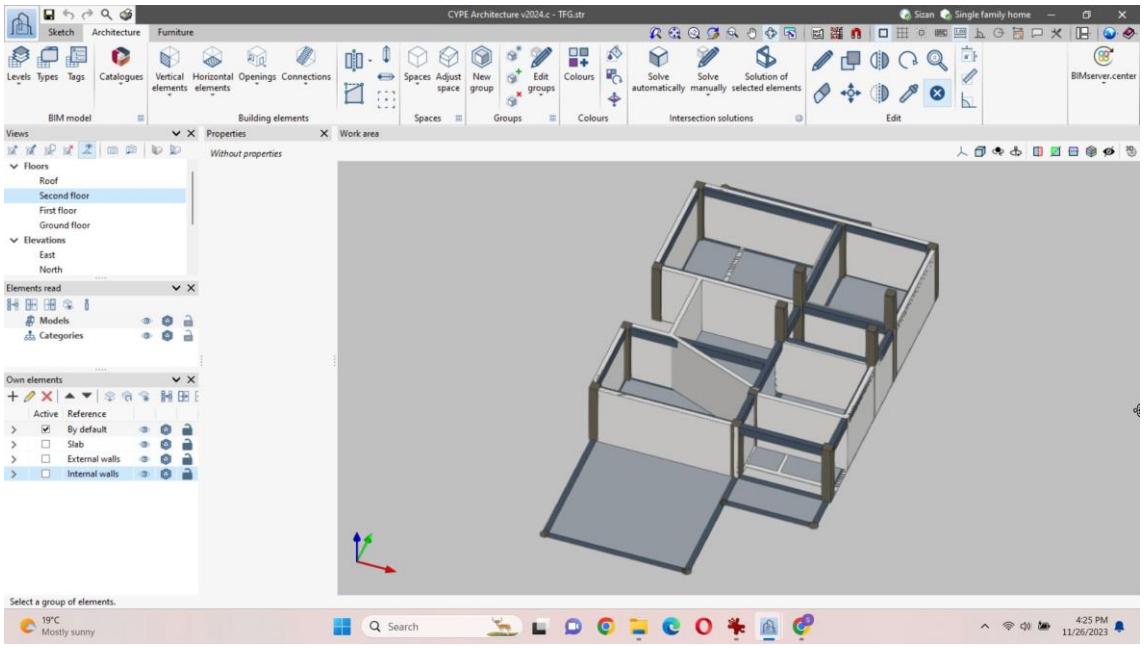
5.1.3.4 Walls

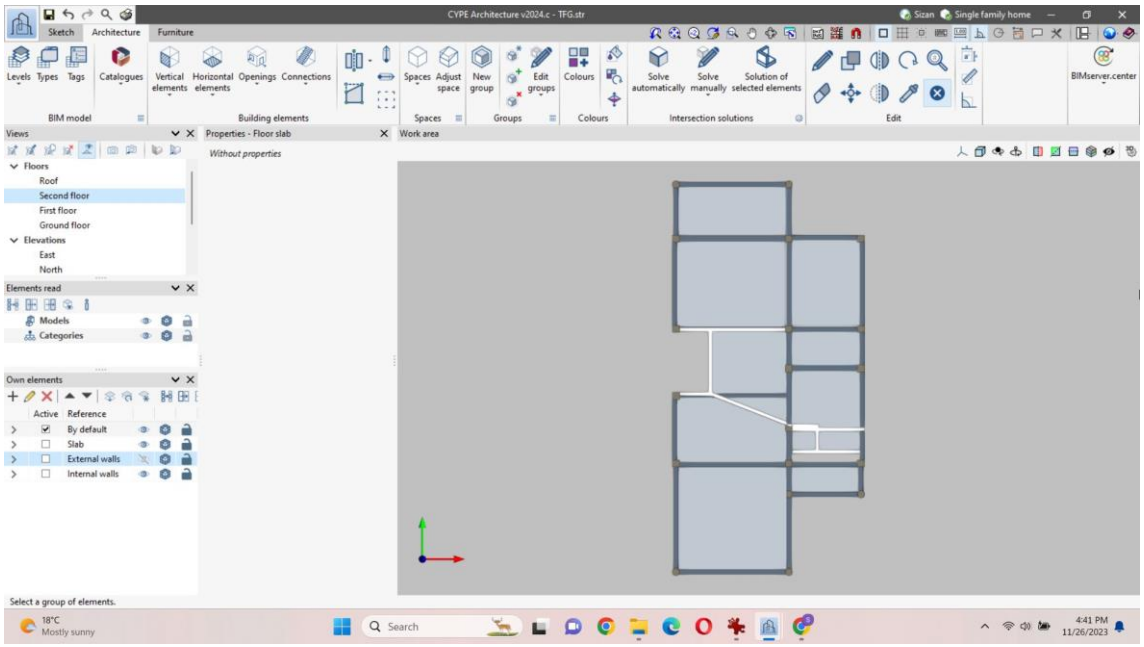
Walls can also be drawn by following the same process as that used for the ground floor.

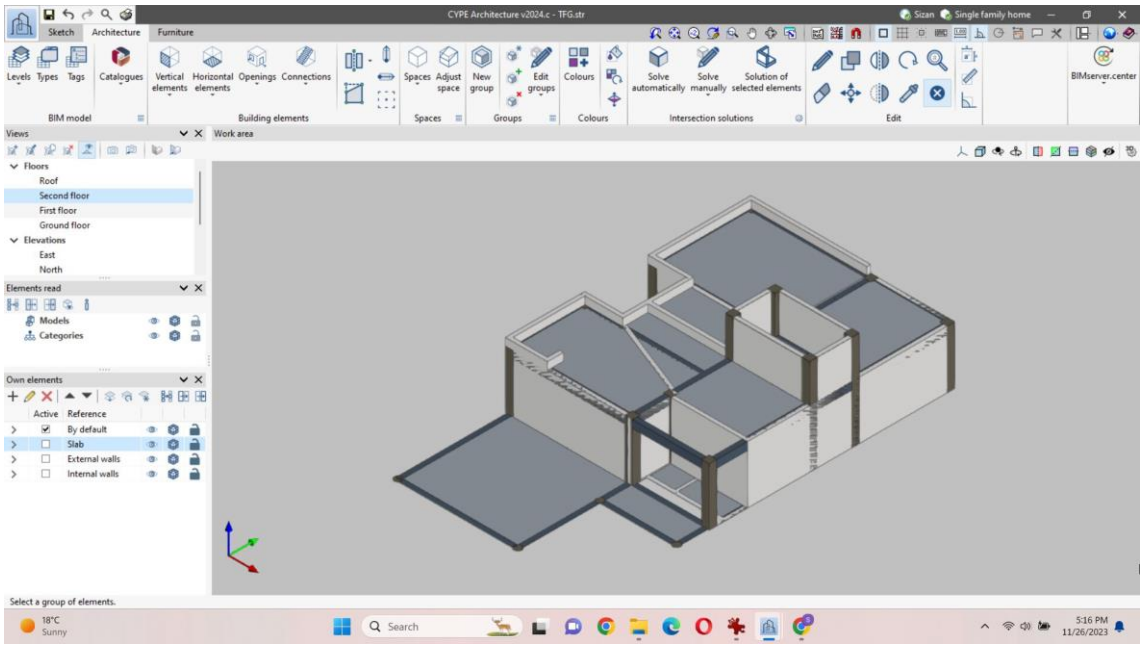


5.1.4 Second floor

The beams, walls and slabs of the second floor are also drawn similarly.

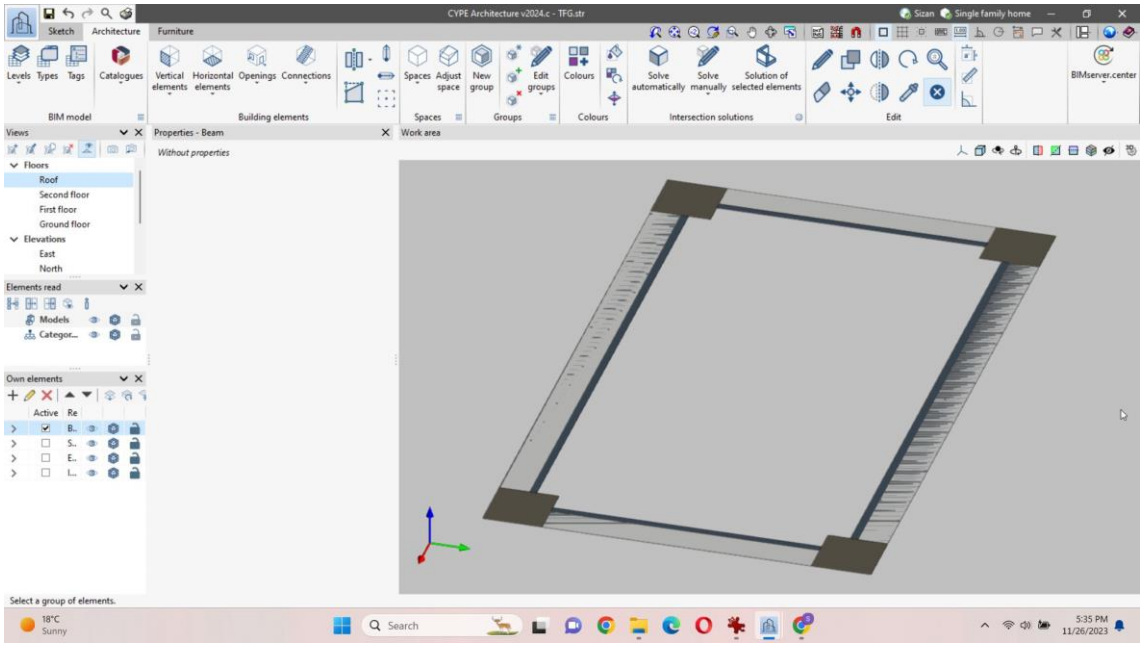

CYPE Architecture v2024.c - TFG.str
Sketch
Architecture
Furniture
Levels
Types
Tags
Cataloques
Vertical elements
Horizontal elements
Openings
Connections
BIM model
Building elements
Spaces
Adjust space
New group
Edit groups
Groups
Colours
Solve automatically
Solve manually
Solution of selected elements
Intersection solutions
Edit
BIMserver.center
Views
Properties
Without properties
Work area
Floors
Roof
Second floor
First floor
Ground floor
Elevations
East
North
Elements read
Models
Categories
Own elements
Active
Reference
By default
Slab
External walls
Internal walls
Select a group of elements.
19°C
Mostly sunny
Search
4:25 PM
11/26/2023


CYPE Architecture v2024.c - TFG.str
Sketch
Architecture
Furniture
Levels
Types
Tags
Cataloques
Vertical elements
Horizontal elements
Openings
Connections
BIM model
Building elements
Spaces
Adjust space
New group
Edit groups
Groups
Colours
Solve automatically
Solve manually
Solution of selected elements
Intersection solutions
Edit
BIMserver.center
Views
Properties - Floor slab
Without properties
Work area
Floors
Roof
Second floor
First floor
Ground floor
Elevations
East
North
Elements read
Models
Categories
Own elements
Active
Reference
By default
Slab
External walls
Internal walls
Select a group of elements.
18°C
Mostly sunny
Search
4:41 PM
11/26/2023



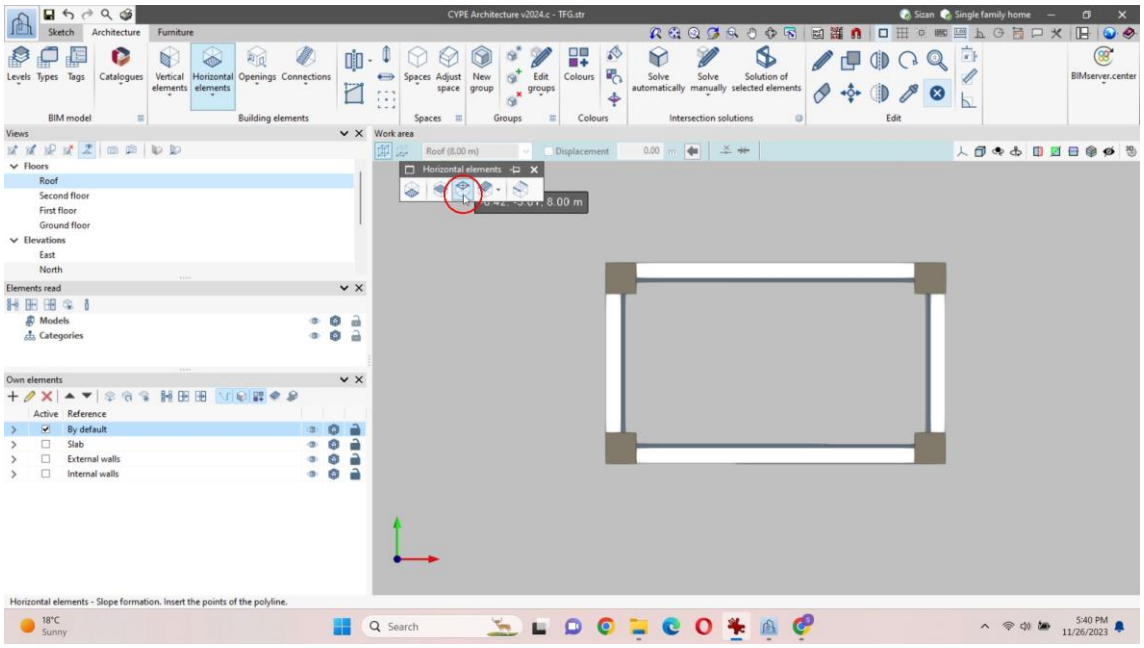
5.1.5 Roof

Firstly, the roof beams are drawn.

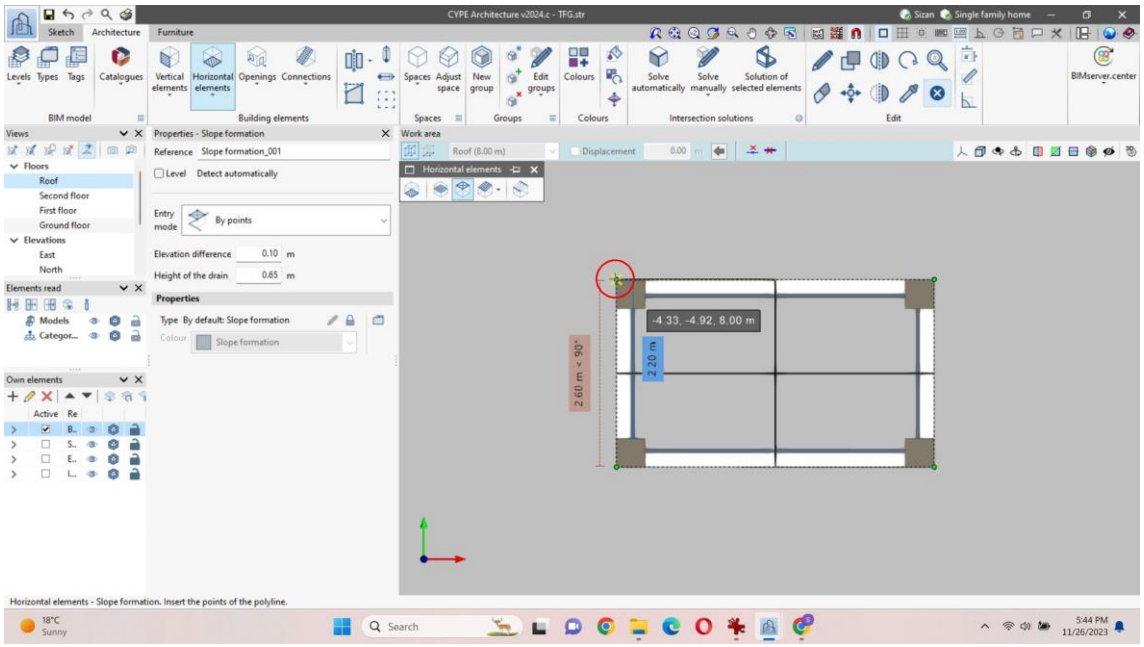


5.1.5.1 Roof slope

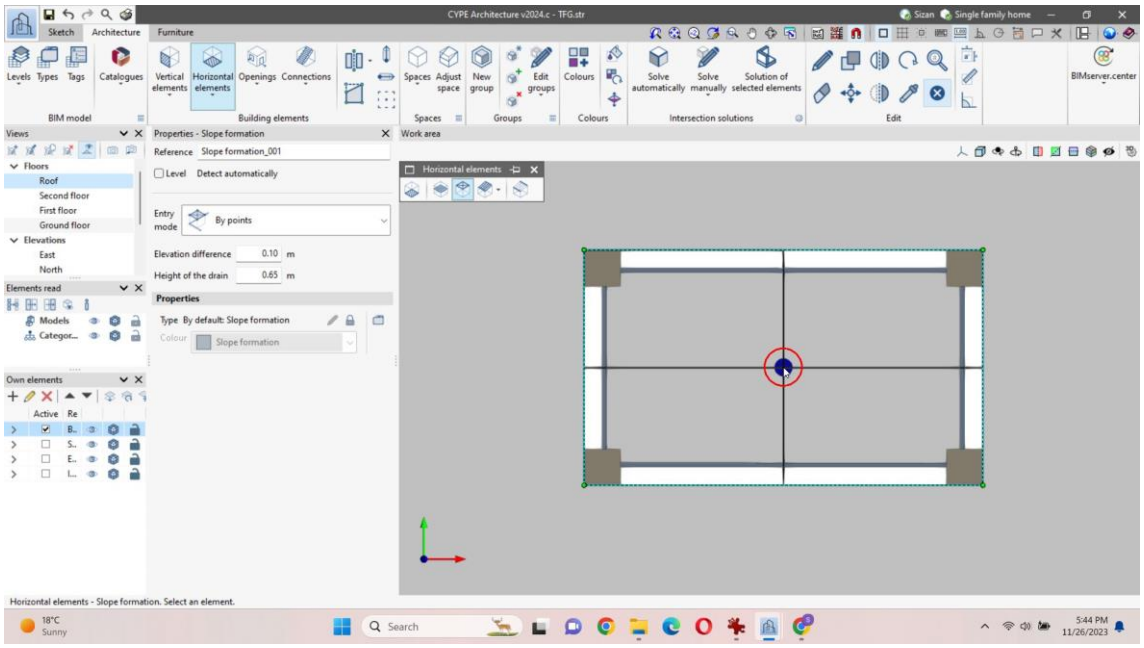
For slope formation, click the icon as shown in the image below.



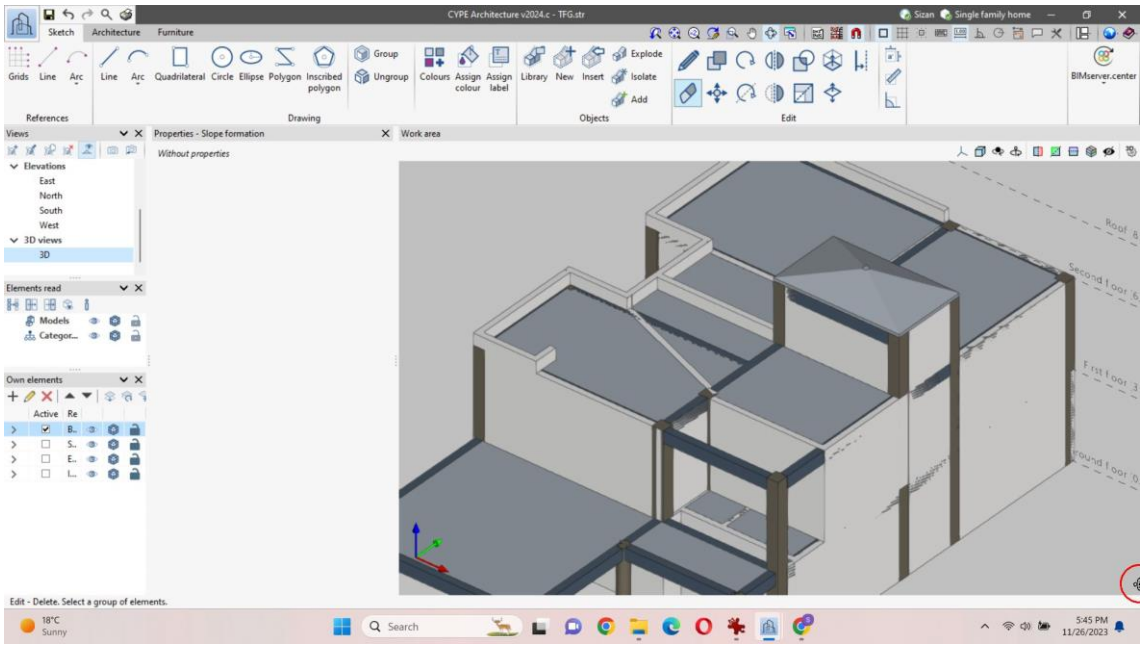
Enter the slope formation data and the select the end points.



Lastly, select the roof vertex and right-click to complete the slope formation.

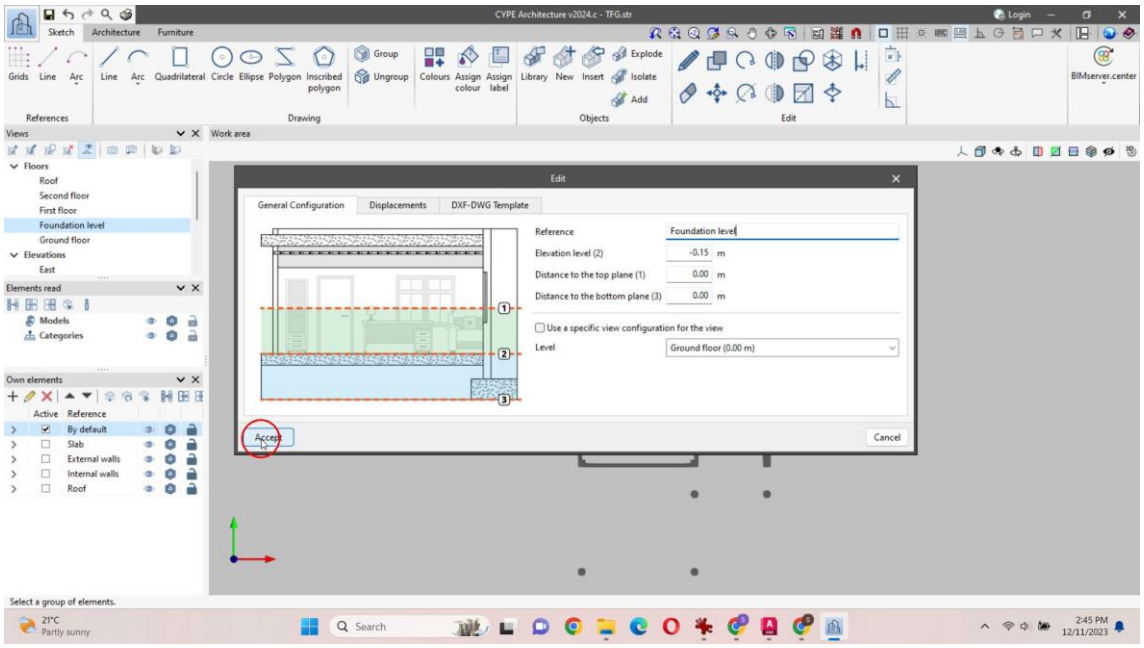


Thus, roof slope can be drawn.

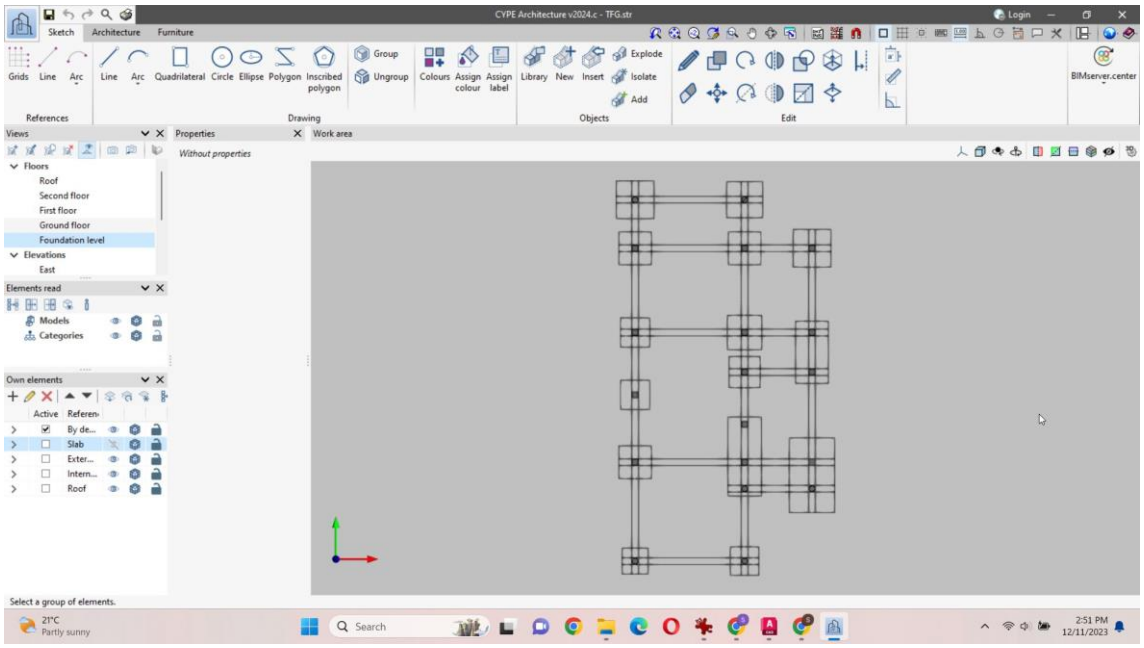


5.1.6 Foundation

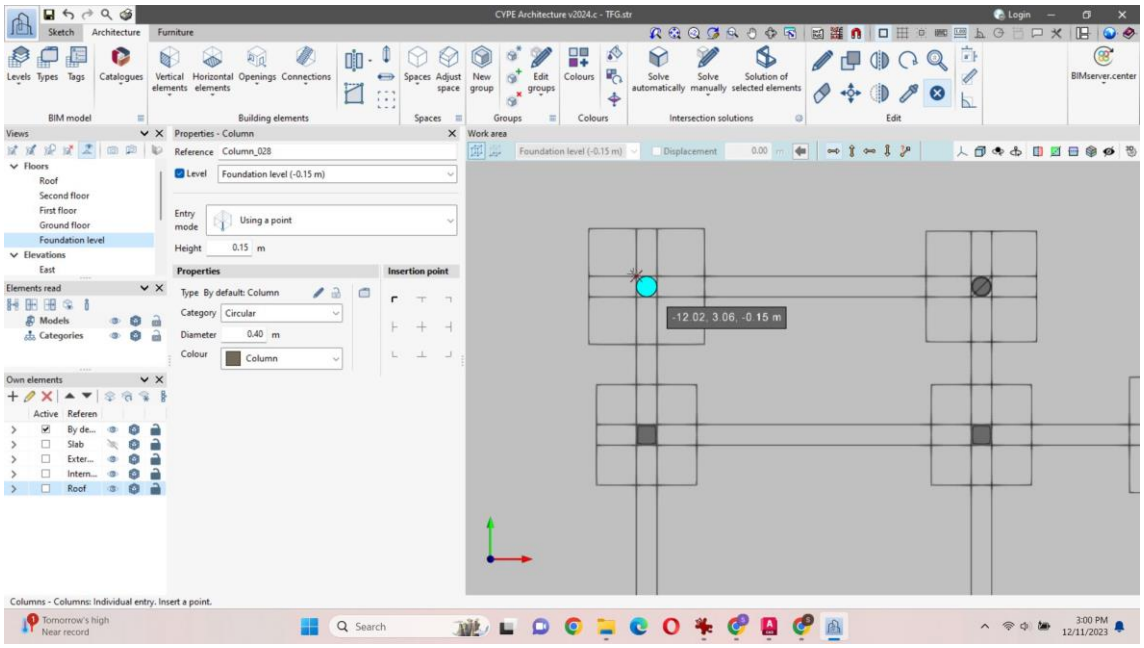
To draw the foundation, firstly create a new floor 0.15m below ground level called Foundation level.

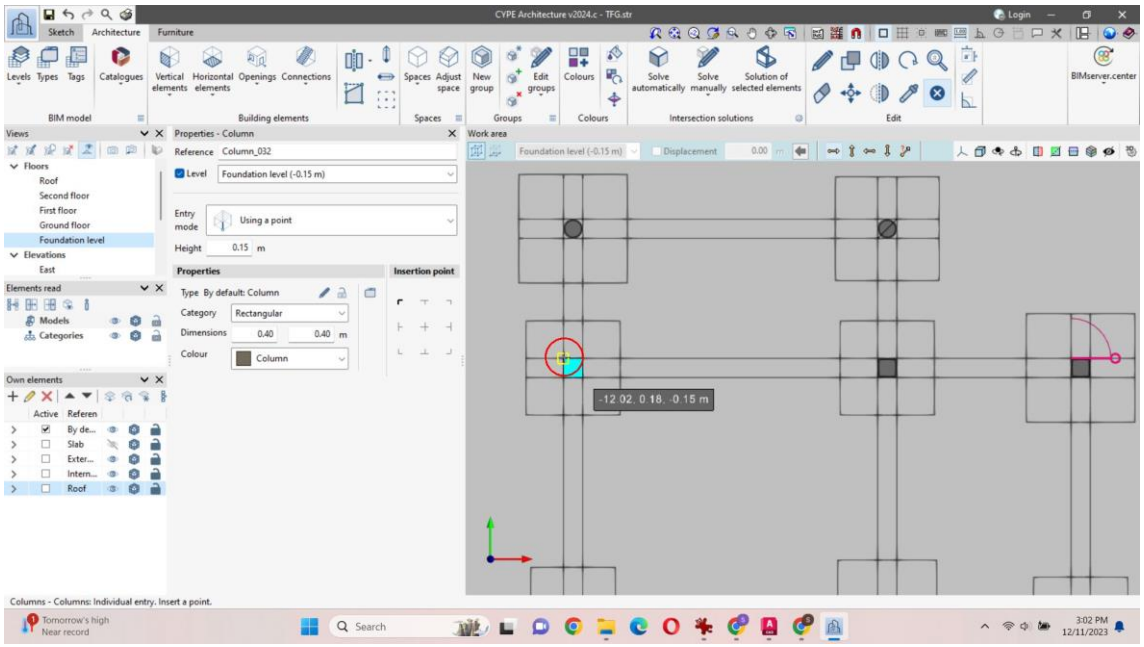


Then, import the template for foundation similar to that for other floors as done above.

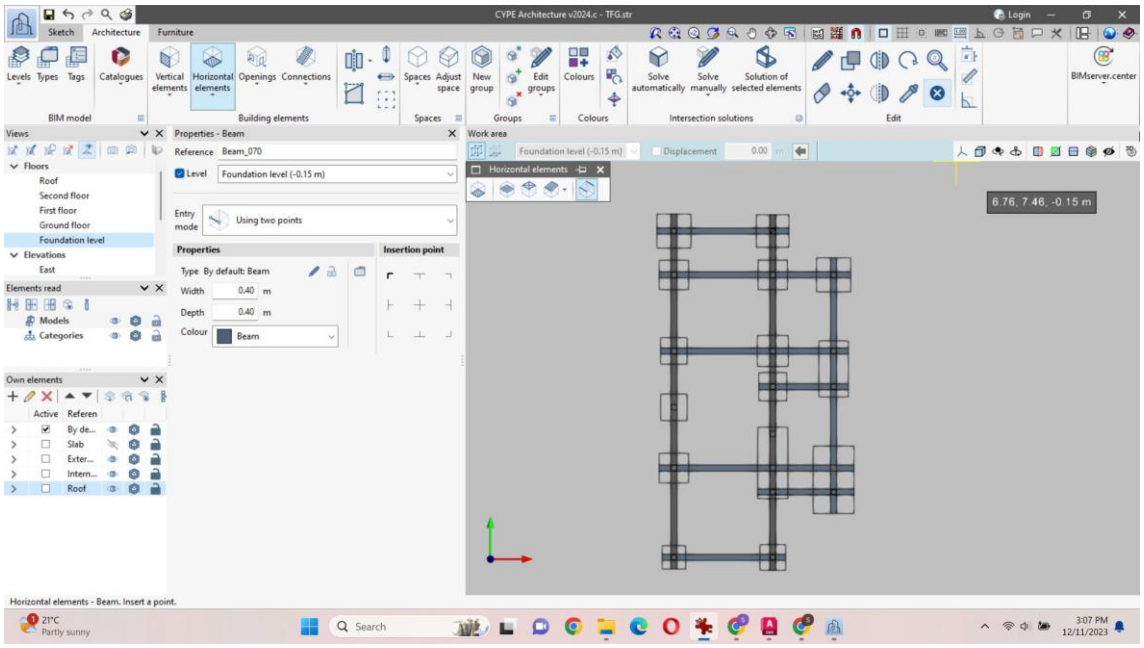


Insert circular and rectangular columns according to the template as shown in the images below.

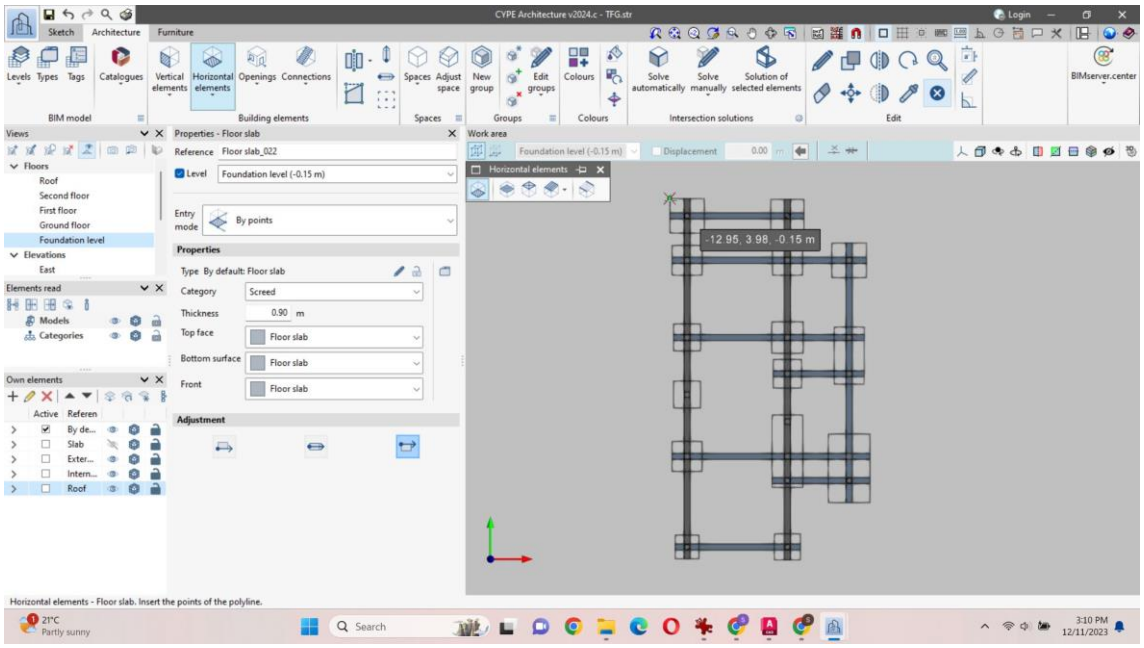




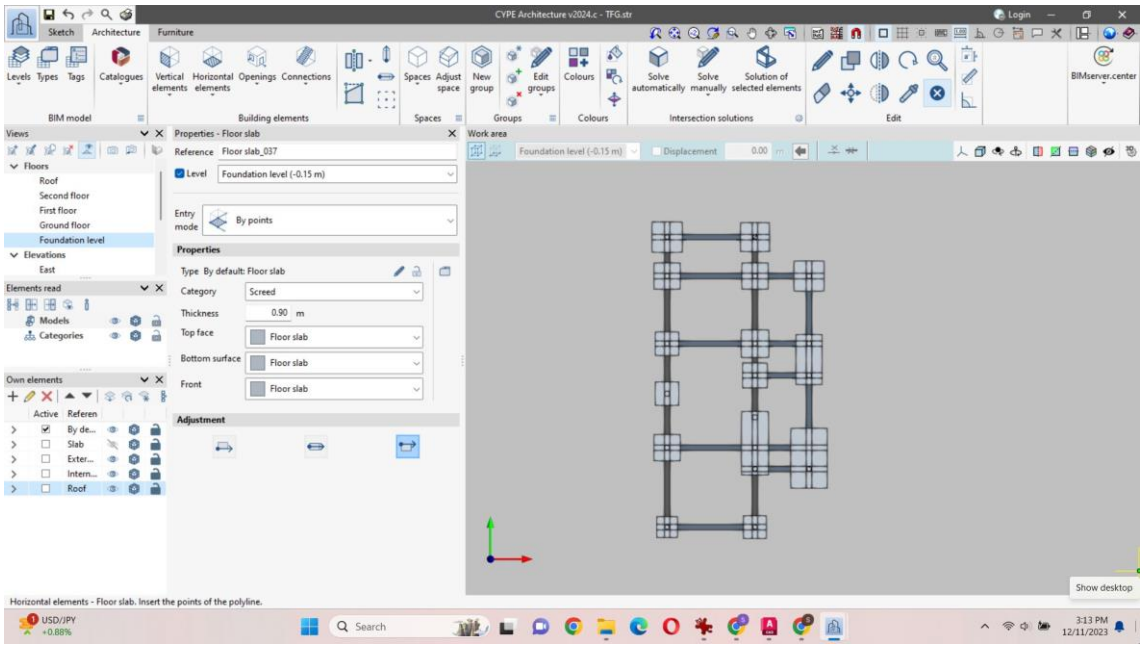
Then, draw beams by following the same procedure as that for other floors.



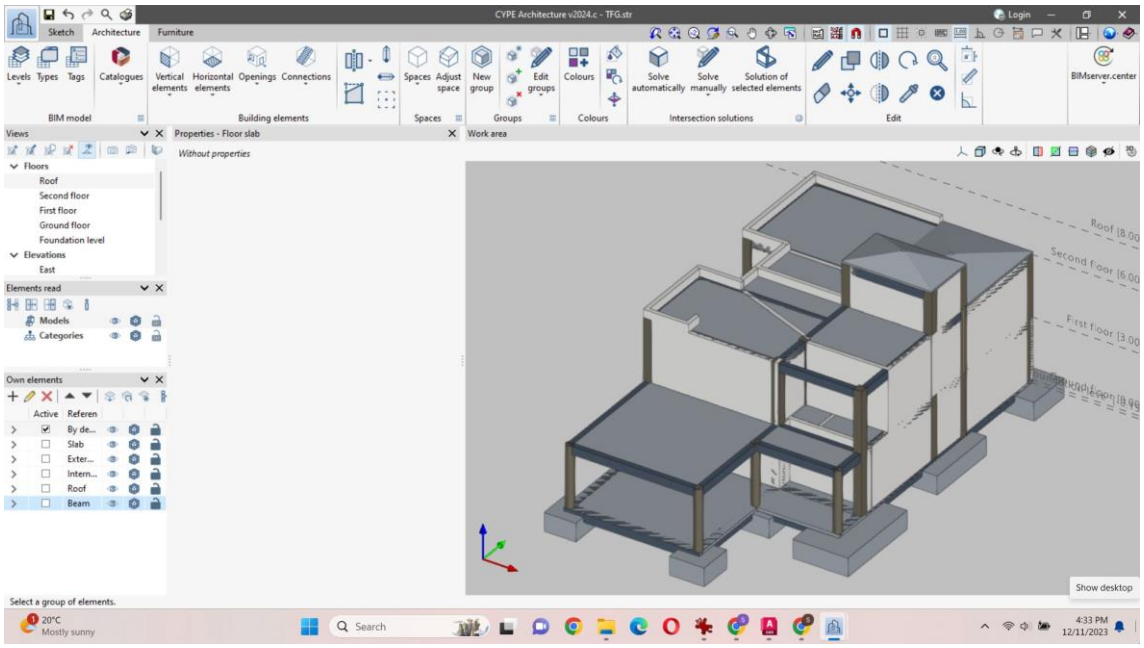
Finally, foundations can be drawn as slabs with the depth of foundation as the thickness of slab as shown in the images below.



Similarly, all the footings can be drawn.



Thus, a single family house can be drawn with Cype Architecture.



References

[1] 'Block VII: 3D BIM Modelling', https://bimvet3.eu/courses/block-vii-3d-bim-modeling-minecraft-revit-and-tekla/.

6 - Deliverables

To evaluate the success of the application, students will have to prepare a report on the steps taken in practice, difficulties faced and decisions taken.

7- What we have learned

To create a three-dimensional model of building using Cype Architecture.

To insert structural and architectural elements in the building.