

Libre Graphics Meeting, London, 2016

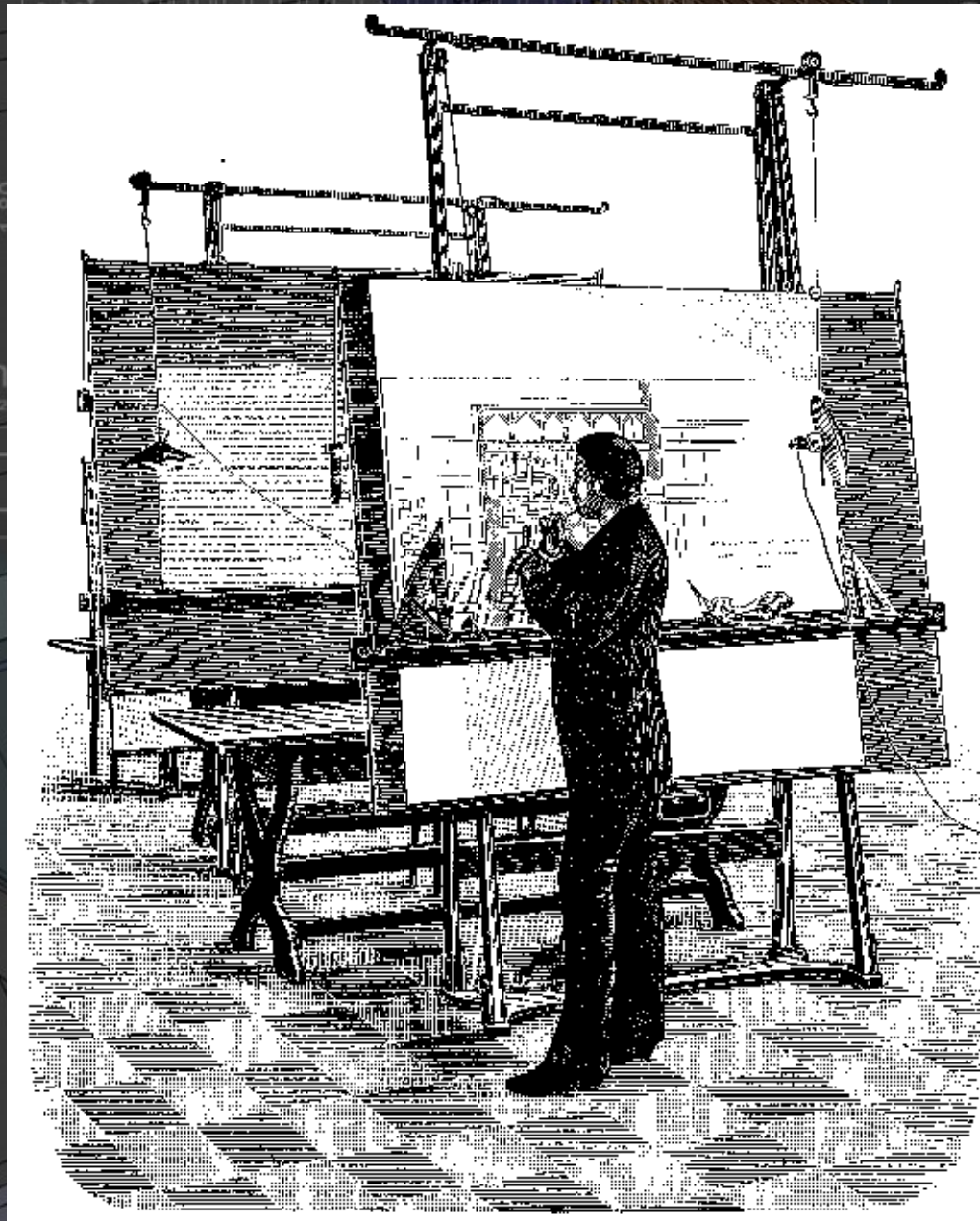
- Architect, one of the (main?) developers of FreeCAD

- @yorikvanhavre

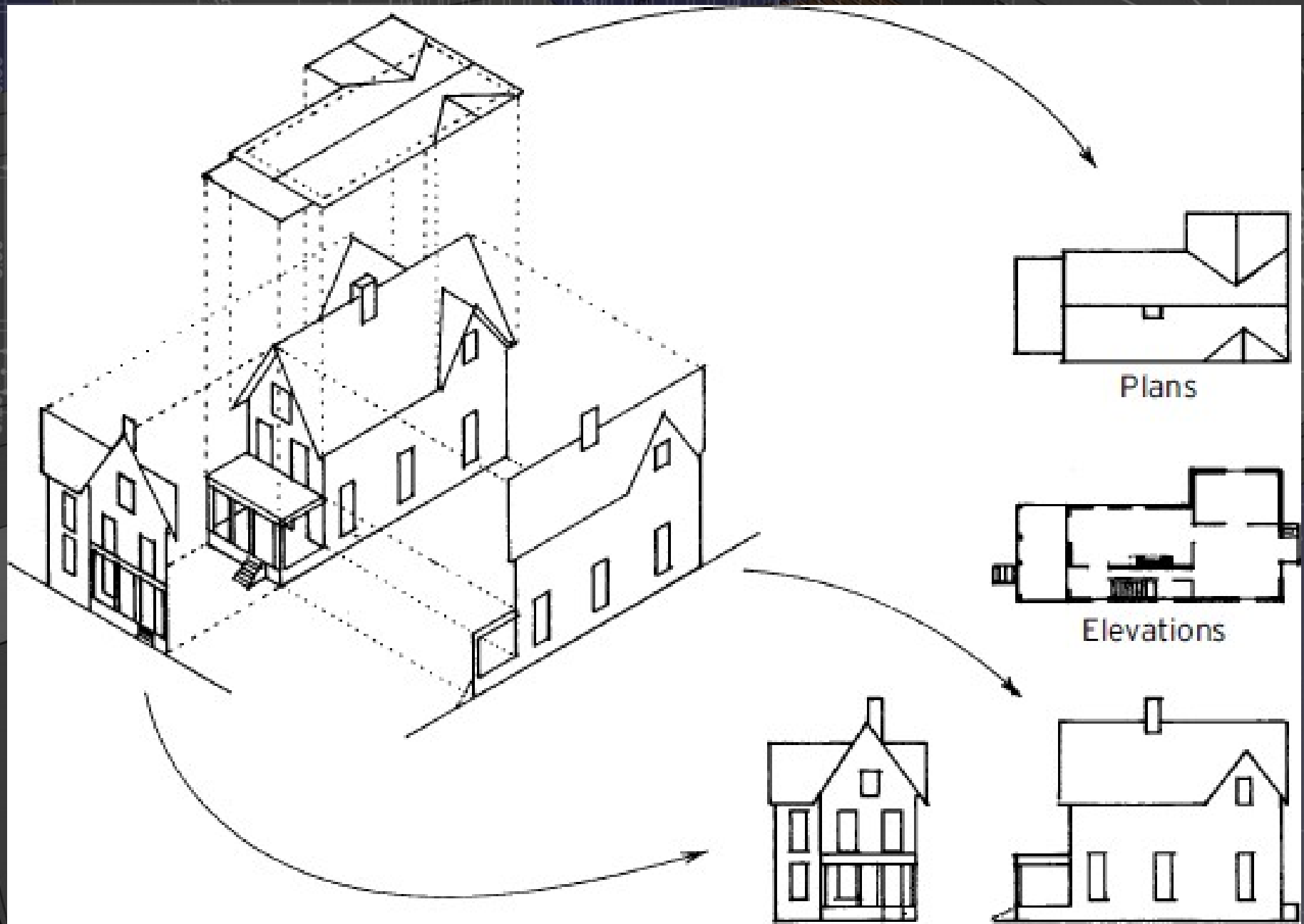


<http://www.uncreated.net>
São Paulo, Brazil

Phase 1: the drawing board



Traditional architectural drawing



Phase 2: 2D CAD



FRONT ELEVATION (East Facing)



SIDE ELEVATION (North Facing)

NOTE:
The Area on the drawing to
within the application
Building Size: 10.0m x 10.0m



FRONT ELEVATION (East Facing)



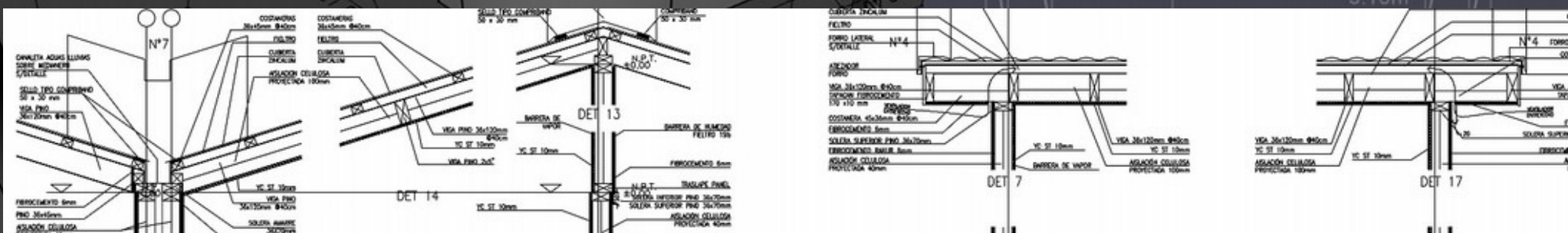
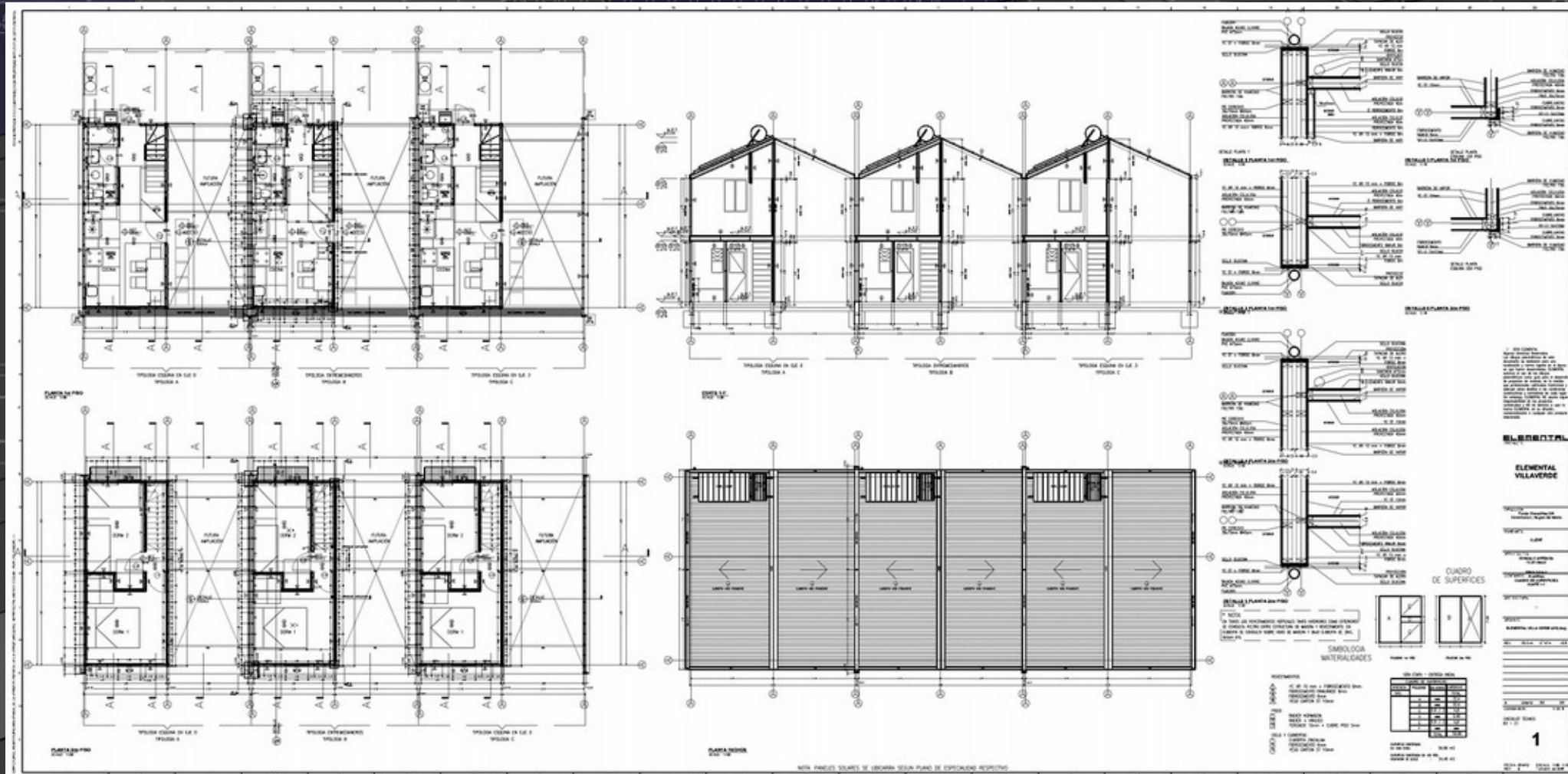
SIDE ELEVATION (North Facing)



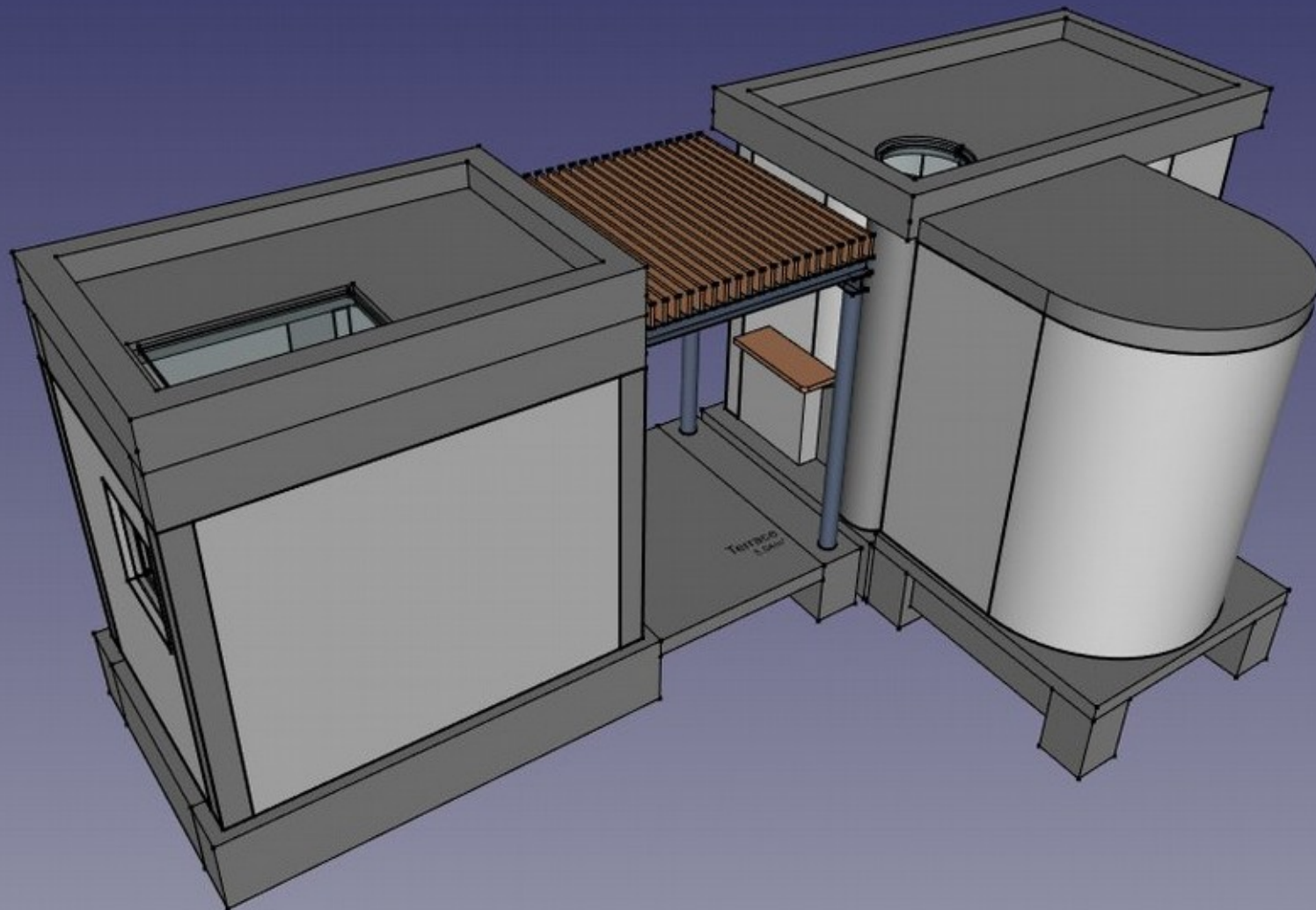
CROSS SECTION

Sightseeing space
3.70m²

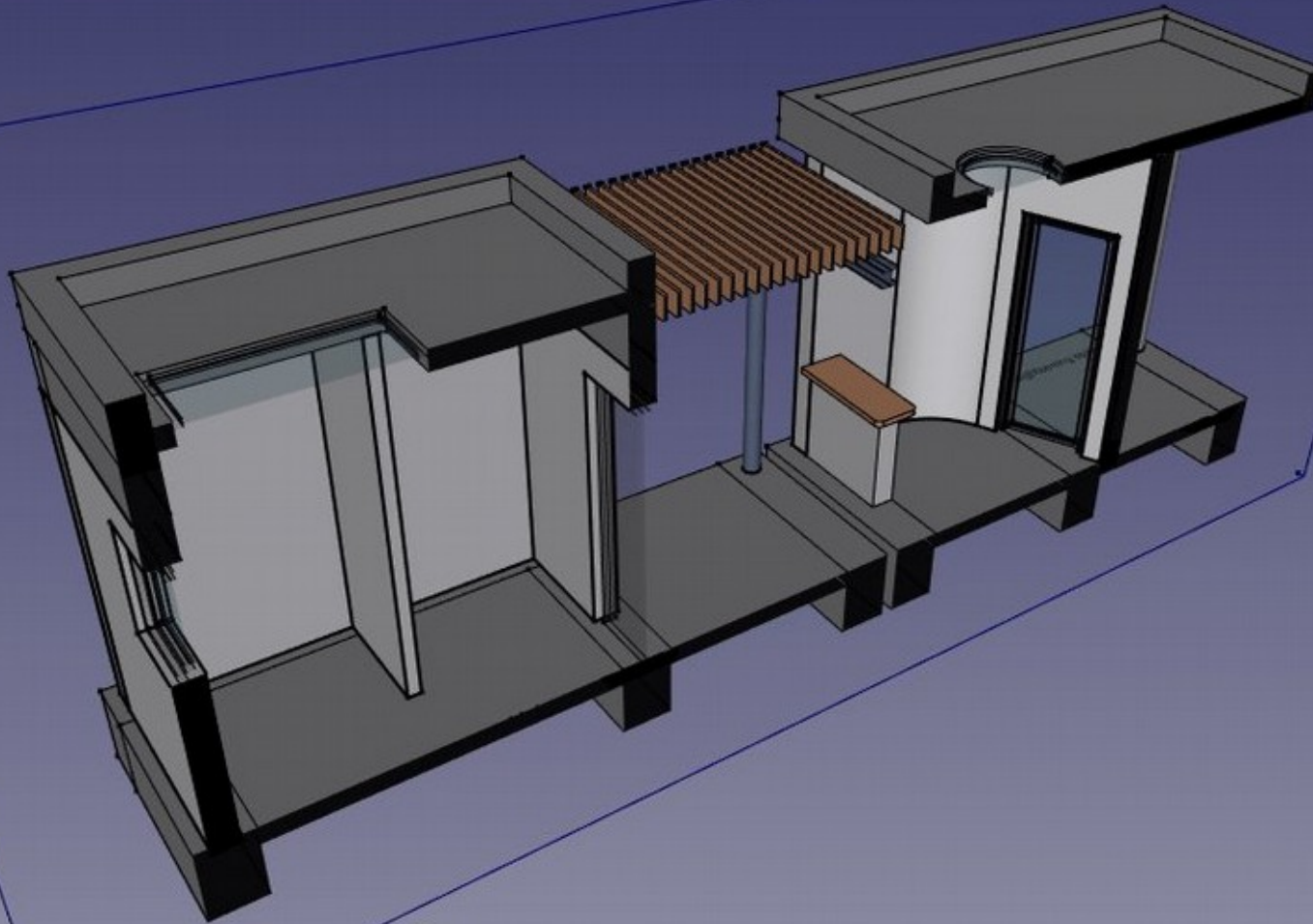
Phase 2: 2D CAD



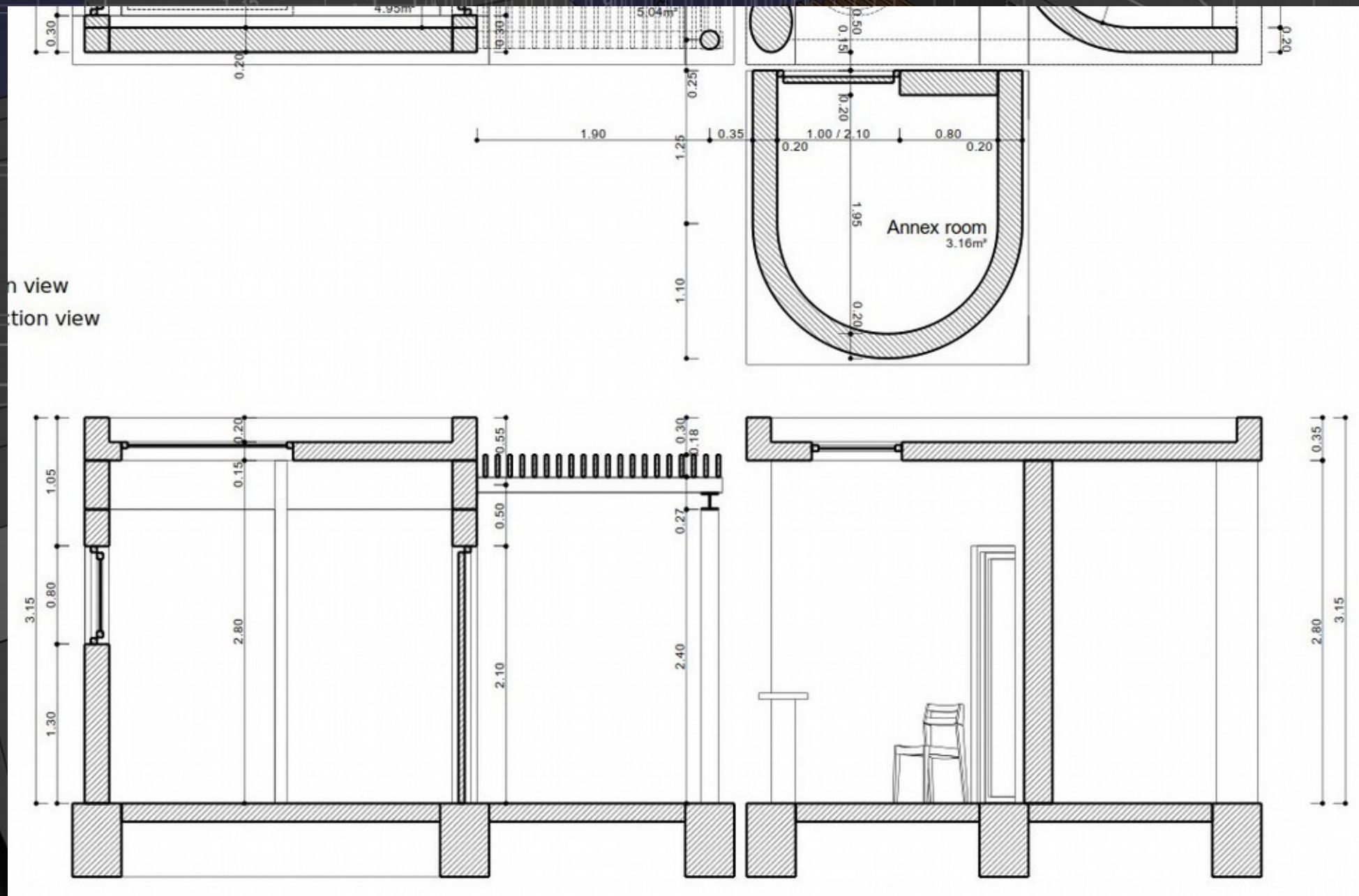
Phase 3: 3D CAD -> BIM



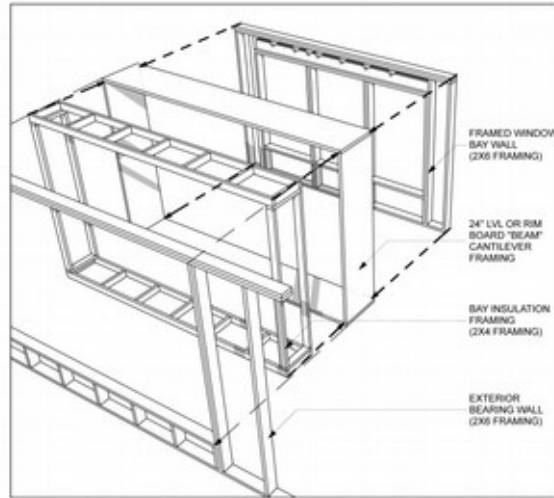
Phase 3: 3D CAD -> BIM



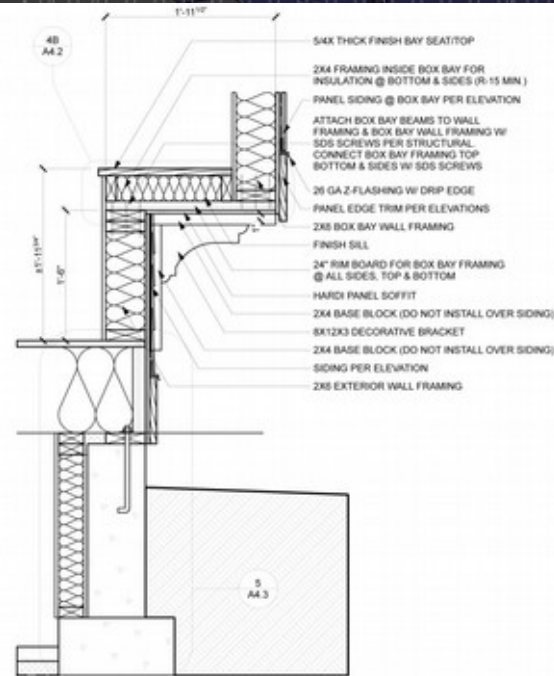
Phase 3: 3D CAD -> BIM



Phase 3: 3D CAD -> BIM



4B WINDOW BAY FRAMING DIAGRAM
NOT TO SCALE



4 BOX BAY CANTILVER
SCALE: 1\"/>

ID	#-01	#-02
INTO ROOM	OPEN PATIO	OPEN PATIO
FROM ROOM		
FLOOR LEVEL	GROUND FLOOR LEVEL	GROUND FLOOR LEVEL
DESCRIPTION	TOP PANEL: DOUBLE AWNING, MIDDLE PANEL, DOUBLE AWNING, BOTTOM PANEL, DOUBLE FIXED LIGHTS	SINGLE TOP HUNG CASEMENT
MANUFACTURER	ALUMINIUM, HULAMIN,NUKLIP-CASEMENT	ALUMINIUM, HULAMIN,NUKLIP-CASEMENT
WALL HOLE DIMENSION	1750 X 2400	750 X 1200
FINISH	P1- POWDER COATED, COLOUR: GLOSS CHARCOAL, ANP 1055	P1- POWDER COATED, COLOUR: GLOSS CHARCOAL, ANP 1055
GLAZING	LAMINATED TO AAAMSA SPEC.	LAMINATED TO AAAMSA SPEC.
IRONMONGERY	ADEQUATE SIZED 5/STEEL GRADE 304, FRICTION HINGES	5/STEEL GRADE 304, FRICTION
FURNITURE	ALUM INTERLOCK WEDGELESS HANDLE	ALUM INTERLOCK WEDGELESS HANDLE
INTERNAL SILL	NA	15 FIBRE CEMENT,PAINTED
EXTERNAL SILL	PLASTERED TO DETAIL	PLASTERED, TO DETAIL

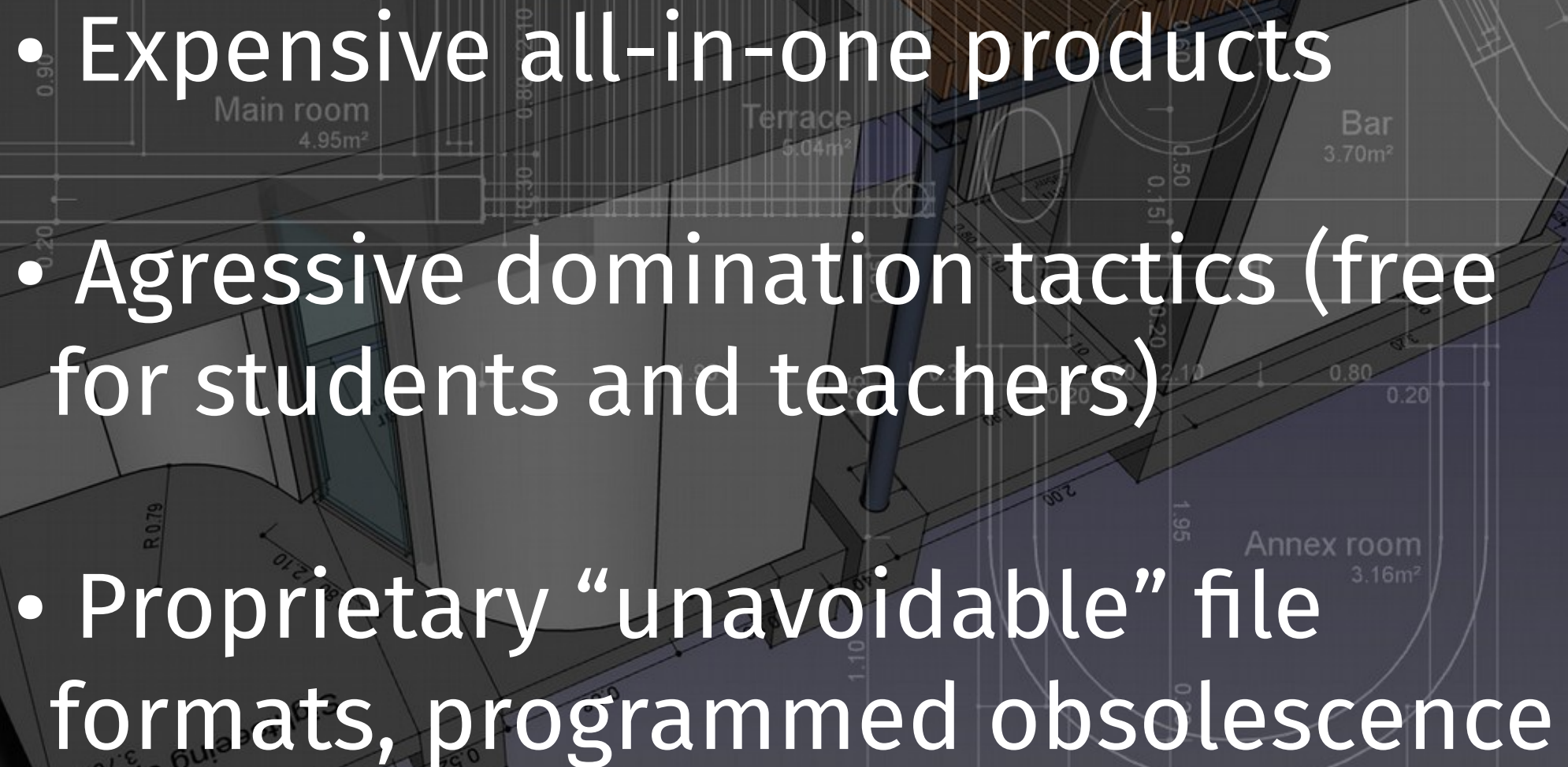
ROOM	FLOOR	WALLS	CEILING	BASEBOARD	TRIM
Dining and living	1" x 4" Oak	1/2" Drywall paint white	1/2" Drywall paint white	Wood	Wood
Bedroom	Carpet w/foam pad	1/2" Drywall paint Beige	1/2" Drywall paint white	Wood	Wood
Bathroom	Linoleum-tan	1/2" Drywall paint white	1/2" Drywall paint white	Lino-cove	Wood
Kitchen	Linoleum-tan	1/2" Drywall paint white	1/2" Drywall paint white	Lino-cove	Wood
Utility room	Linoleum-tan	1/2" Drywall paint white	1/2" Drywall paint white	Lino-cove	Viny l



The state of BIM

- Widely used in some countries, while in others still mostly 2D CAD
- Some authorities (France, UK) moving to make BIM mandatory
- Almost 100% of BIM software in the hands of only 2 firms worldwide

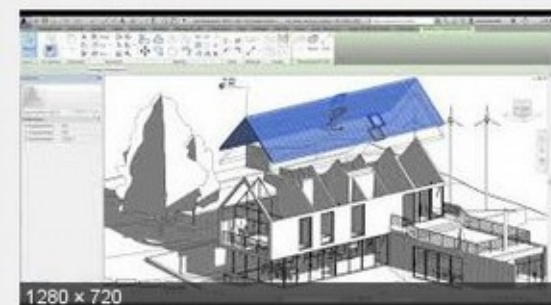
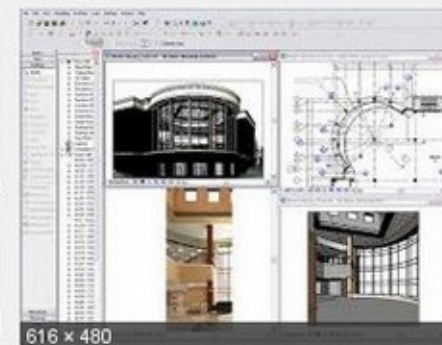
Revit (Autodesk), ArchiCAD, AllPlan, VectorWorks (Nemetschek)

- 
- Expensive all-in-one products
 - Aggressive domination tactics (free for students and teachers)
 - Proprietary “unavoidable” file formats, programmed obsolescence

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The good side

- Many actors in construction: engineers, builders, etc
- For the first time, an open format maintained by a consortium: IFC
- Authorities like IFC and help to push it forward

IFC files are human-readable

#01: Site

#02: Building

#03: Relationship: #02 included in #01

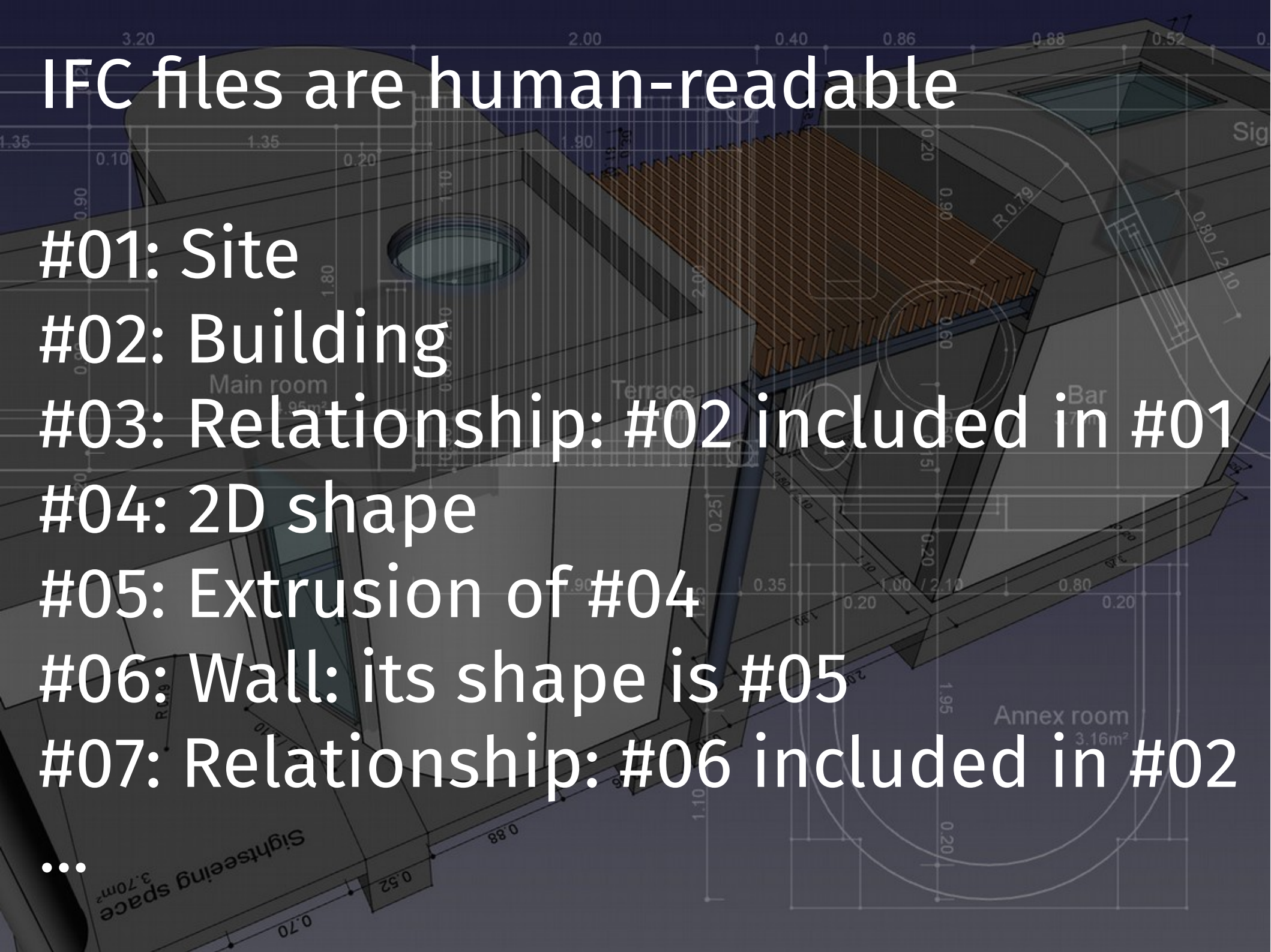
#04: 2D shape

#05: Extrusion of #04

#06: Wall: its shape is #05

#07: Relationship: #06 included in #02

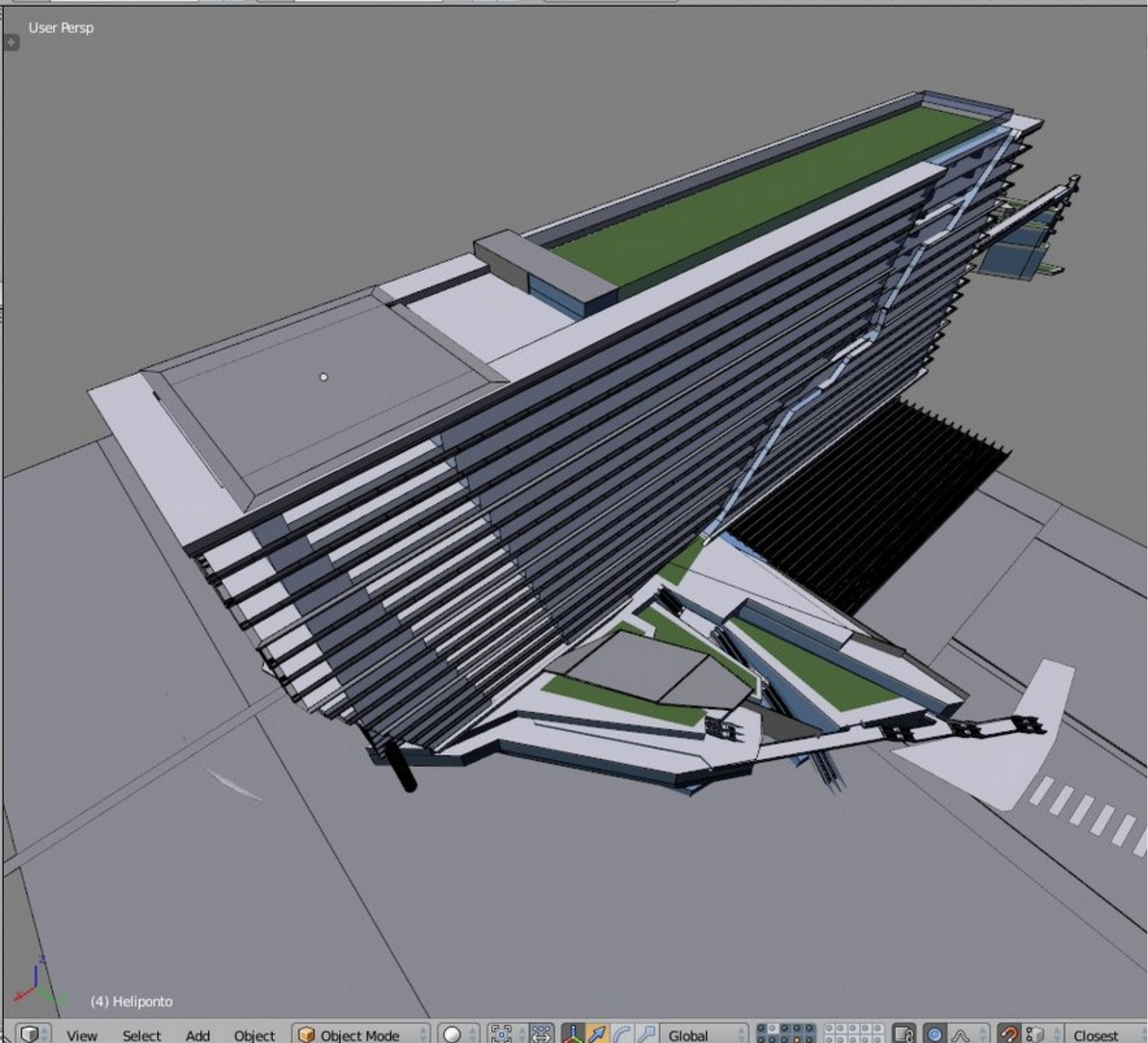
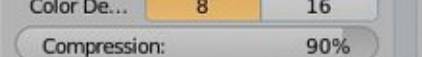
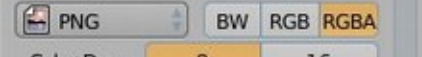
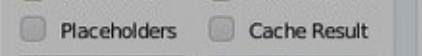
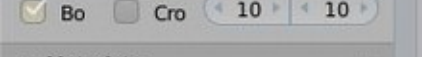
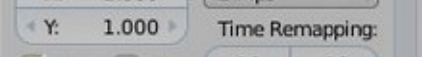
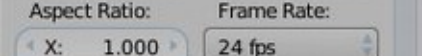
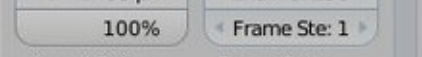
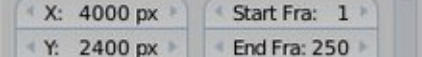
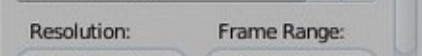
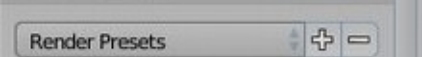
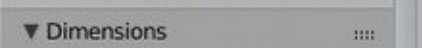
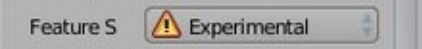
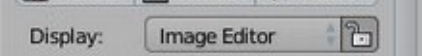
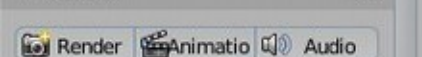
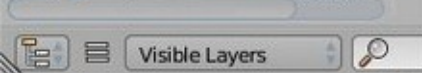
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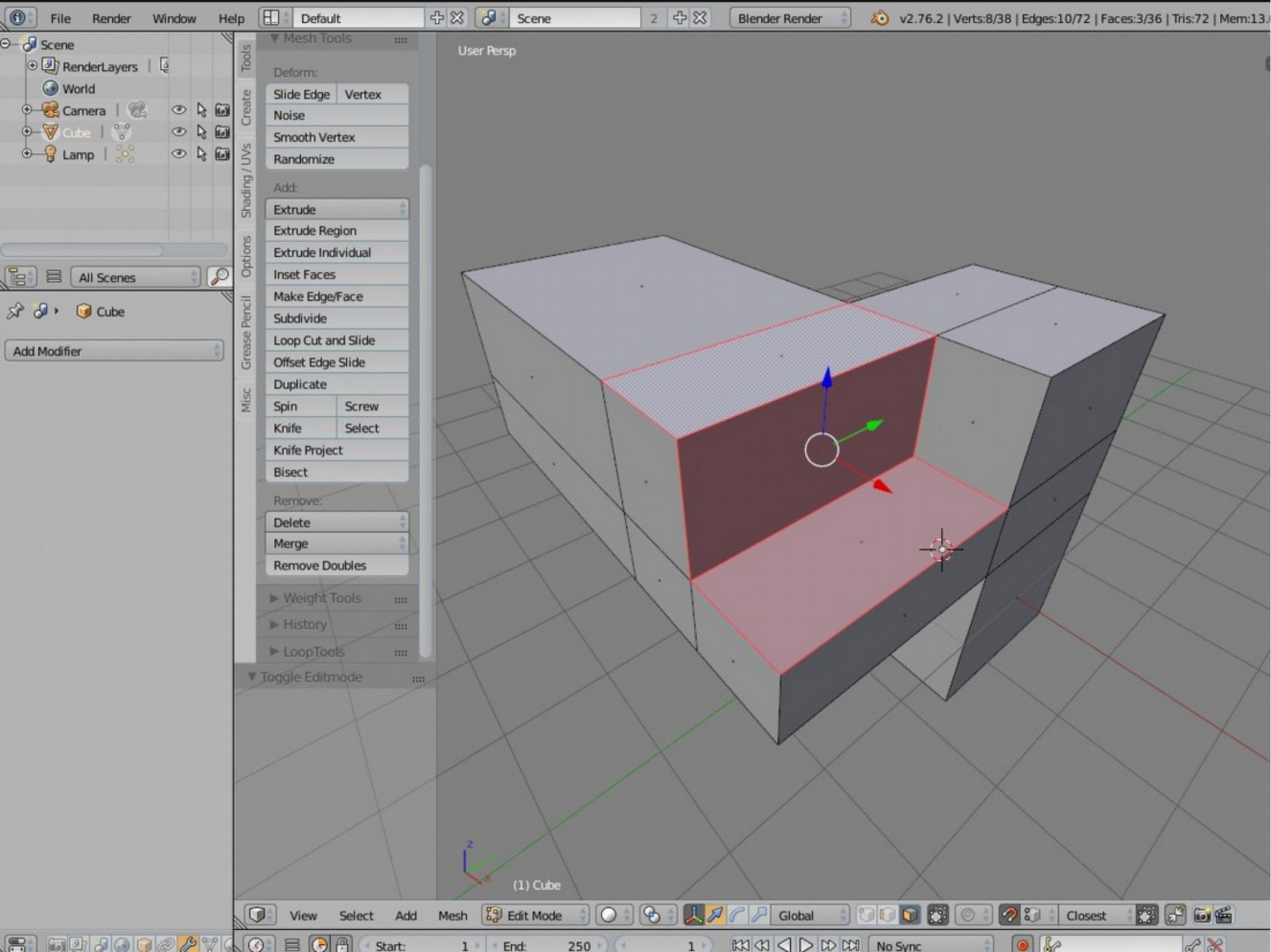


A detailed 3D architectural rendering in Blender, showing a complex building interior. The scene includes a large main room, a terrace, a bar, and an annex room. Various technical dimensions are visible throughout the model, such as 3.20, 2.00, 0.40, 0.86, 0.88, 0.52, 1.35, 1.90, 0.20, 0.90, R 0.79, 0.80 / 2.10, 1.80, 2.00, 0.60, 0.20, 0.50, 0.15, 0.20, 1.10, 2.00, 1.95, 0.40, 0.70, 0.52, 0.80 / 2.10, 0.70, 0.52, 0.80 / 2.10, 0.70, 0.52, 0.80 / 2.10. Room labels include 'Main room', 'Terrace', 'Bar', and 'Annex room'. The text 'We have Blender. Why not modeling architecture with Blender?' is overlaid at the top.

We have Blender. Why not modeling architecture with Blender?

- Fast. VERY fast. Mind-to-mouse connection
- All kinds of fancy tools from the gaming world
- Realistic rendering included (cycles)







(1) suportes passarela

User Persp
Meters

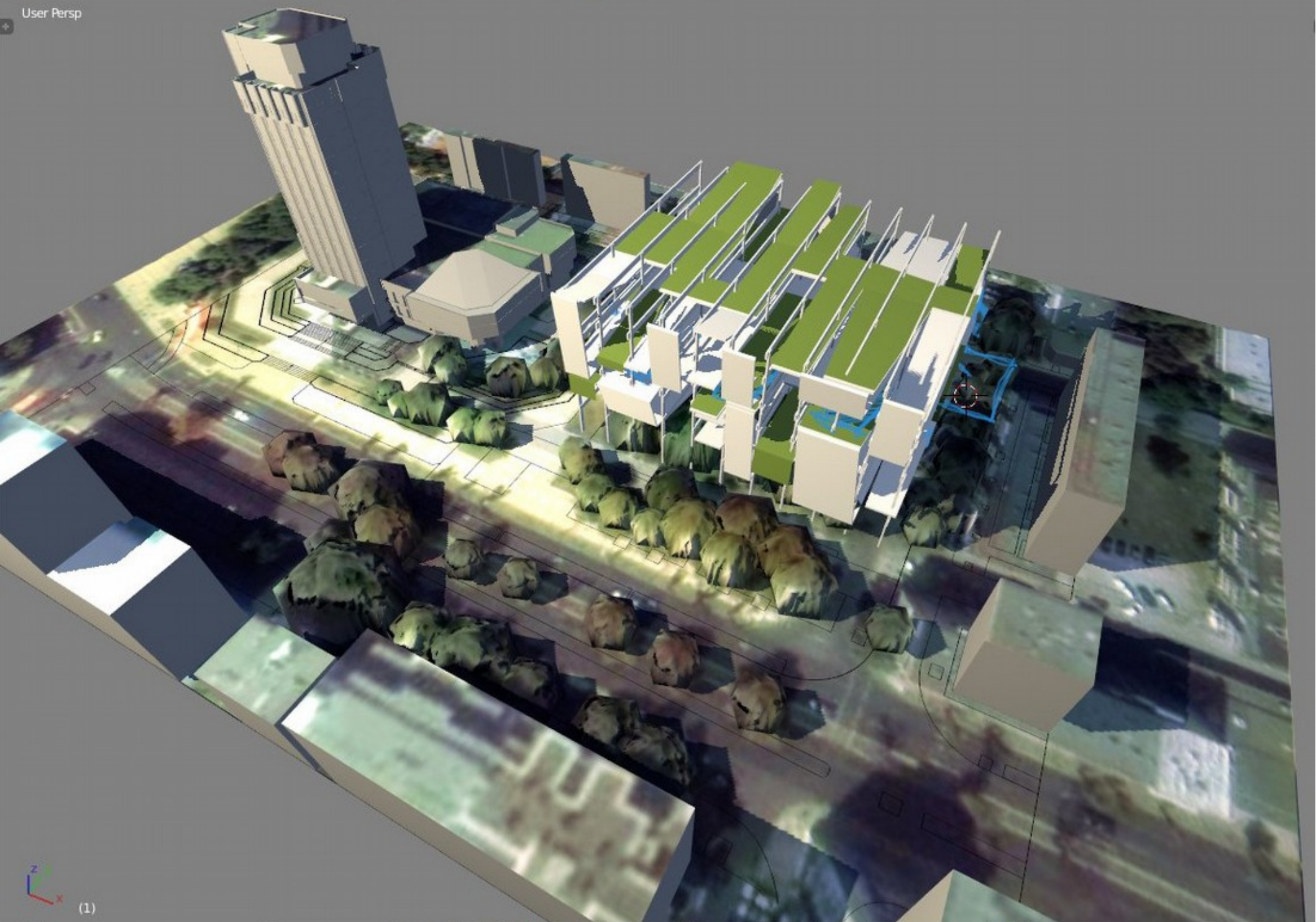


(1) suportes passarela



(1) Plane.013









Why not doing BIM in Blender?

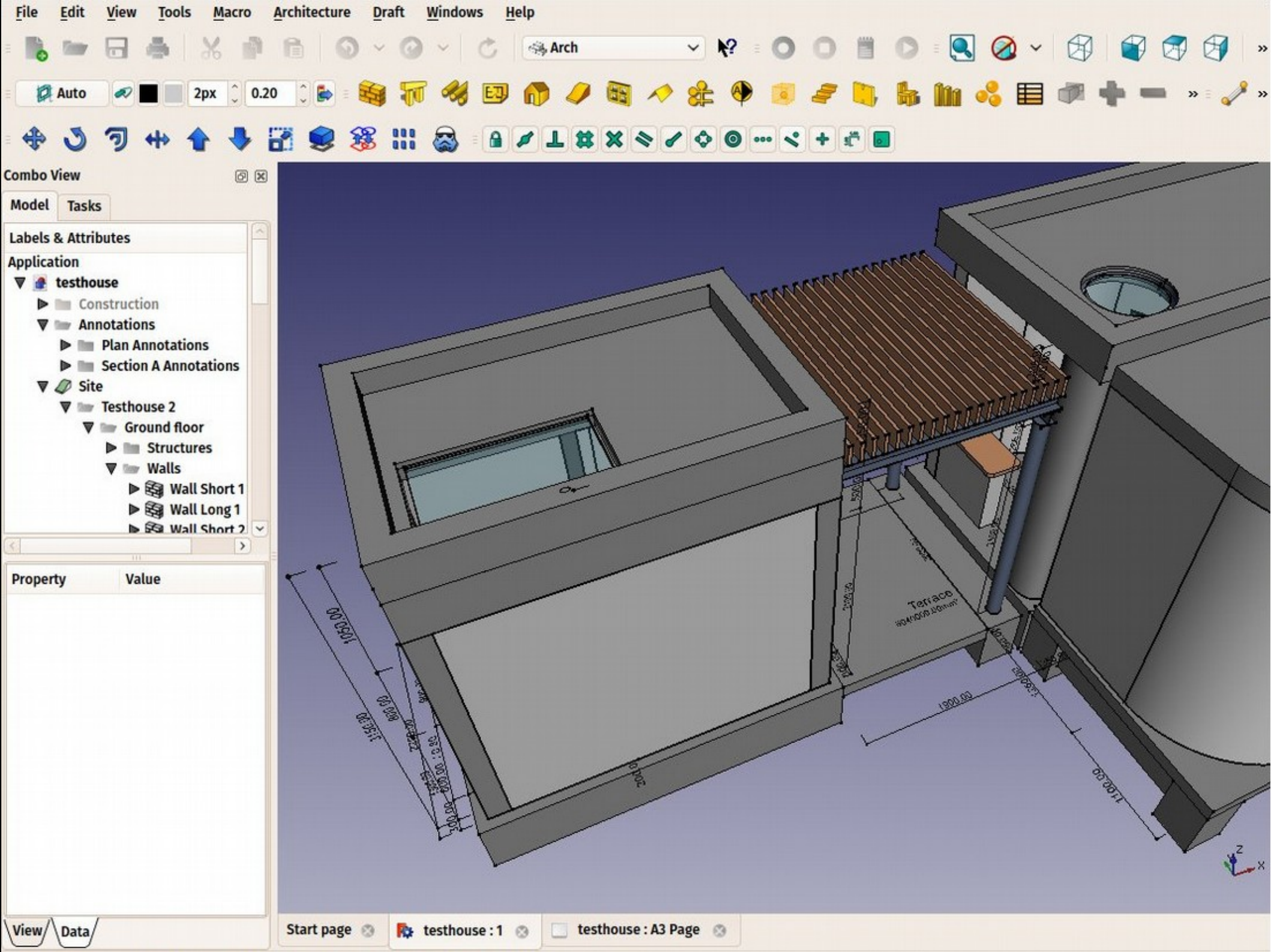
- Blender is mesh-based: Speed and freedom
- But we need slower, complex, parametric, precise tools too
- Unix philosophy: several tools working together rather than one

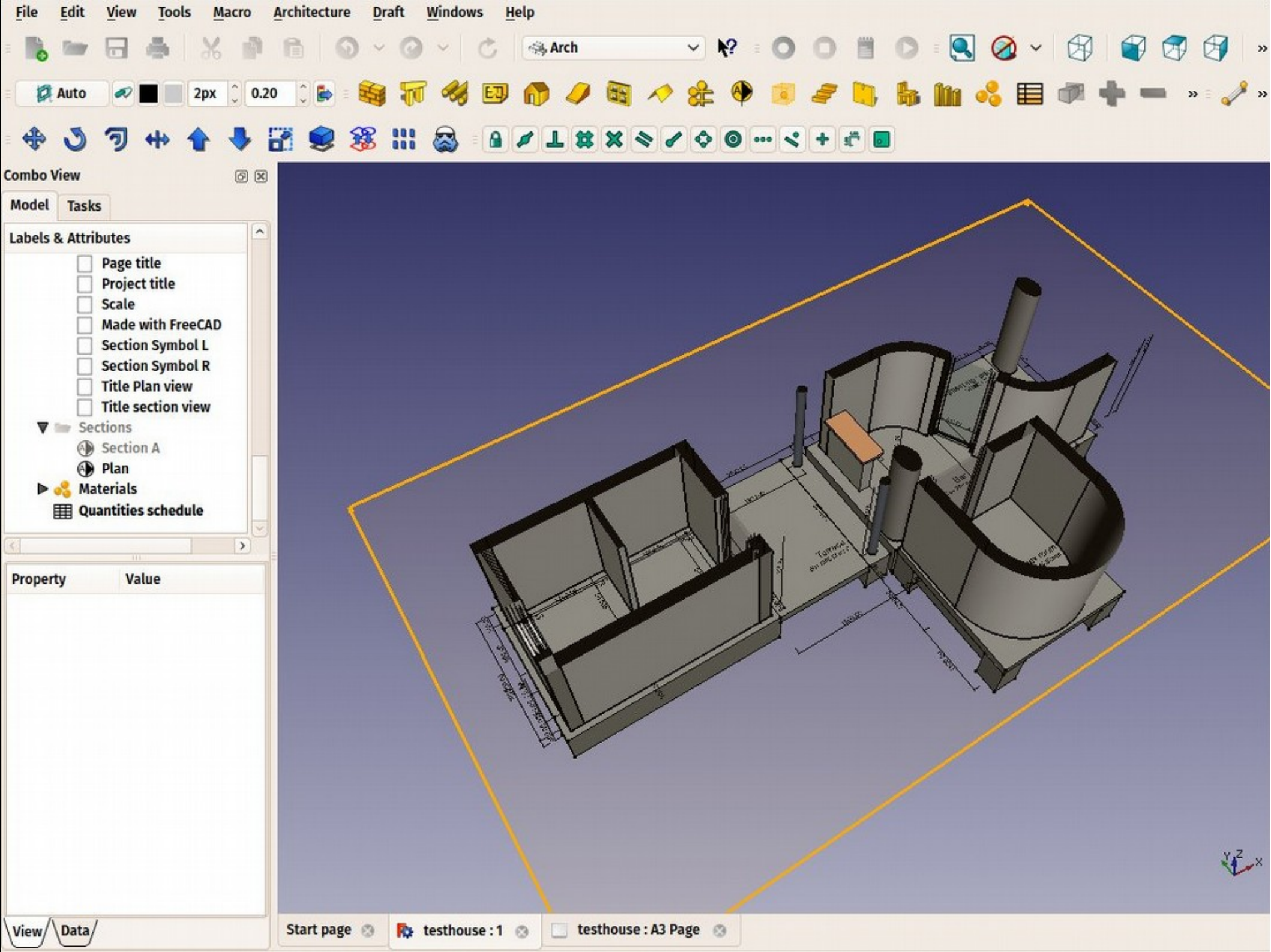
FreeCAD: “technical” 3D modeling

- Precise, parametric, modifiable, “undoable” objects
- Omnivore: Meshes, NURBS, solid-based geometry, etc
- Highly extensible data model, can accomodate all our BIM & IFC stuff

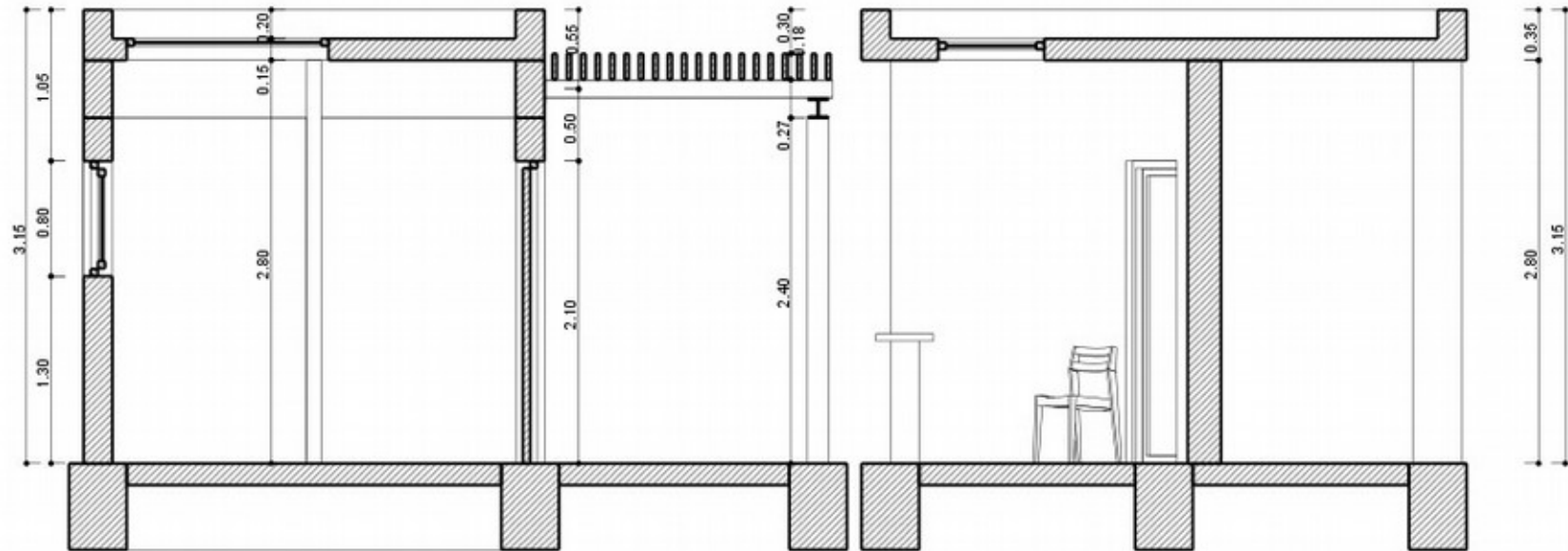
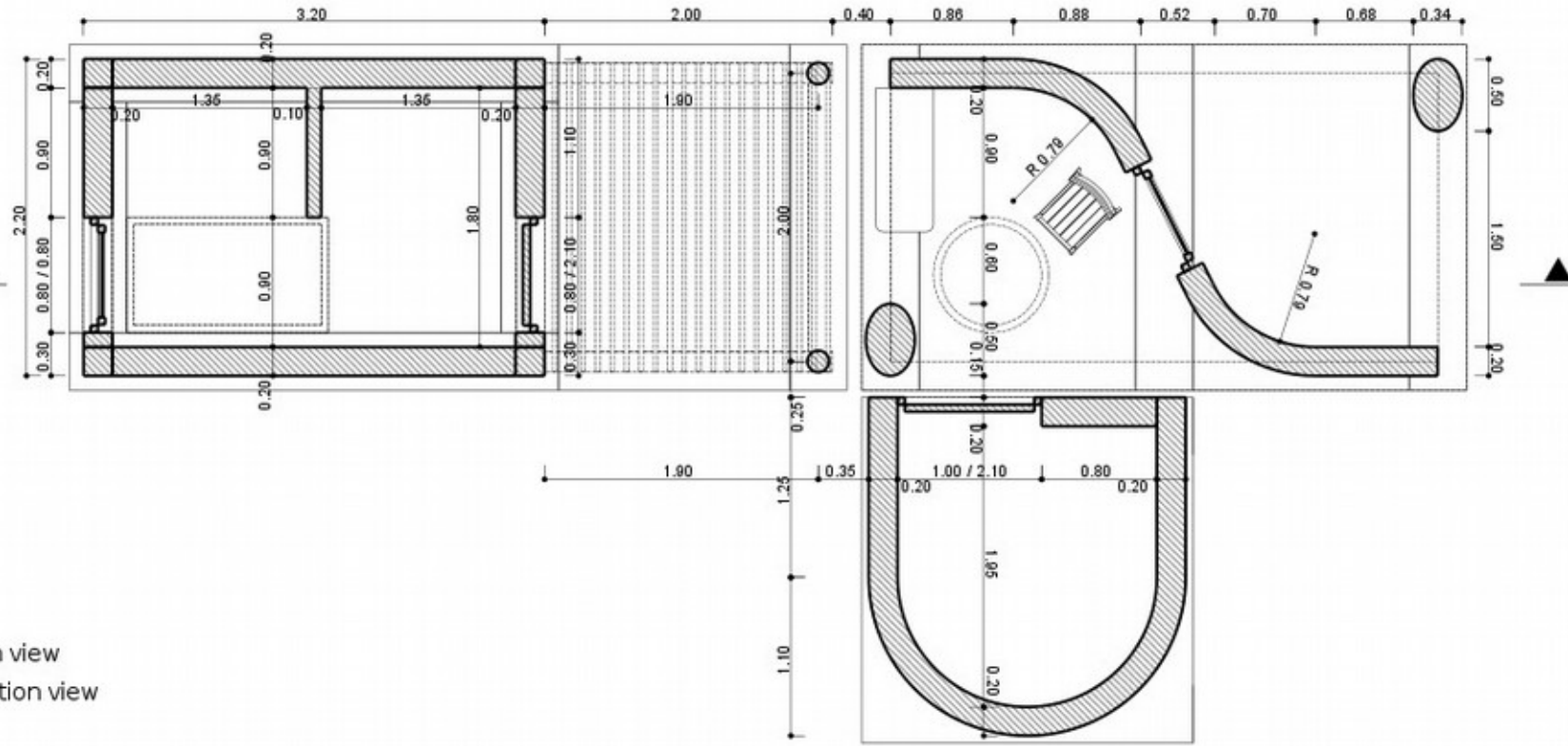
The Architecture module of FreeCAD

- Made for freedom: Will Take Any Blender Mesh!
- Made to speak IFC right from the start, tolerant with dialects
- Much to learn from other modules, other users and other specialties





Plan view
Section view

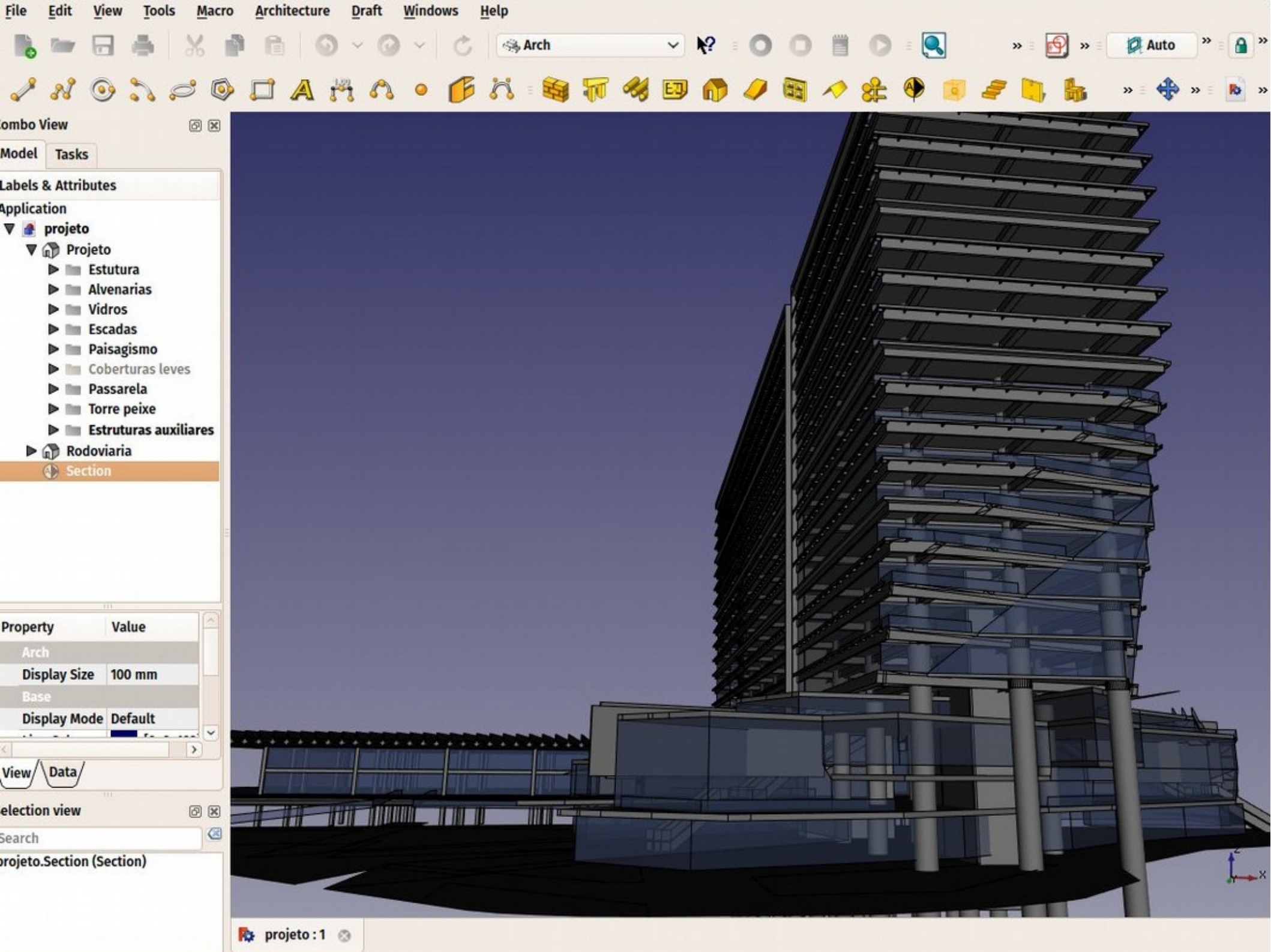


Test House
Plan and Section
Scale: 1:33

Made with FreeCAD



	A	B	C	D	E	F	G	
1	Quantities schedule							
2	Project: testhouse							
3	Date: Sun Apr 26 13:52:25 2015							
4								
5		Material	Description	Color	Item	Volume (m³)		
6								
7	1. Columns							
8								
9		Steel	Structural steel, protected and painted for exterior use		Metal column 1	0.0424115		
10					Metal column 2	0.0424115		
11					Total	0.084823		
12								
13		Concrete	25MPa cast-in-place structural concrete		Column 1	0.096		
14					Column 2	0.096		
15					Column 3	0.096		
16					Column 4	0.096		
17					Column Extension 1	0.37385		
18					Column Extension 2	0.37385		
19					Total	1.1317		
20								
21	2. Beams							
22								
23		Steel	Structural steel, protected and painted for exterior use		Metal beam 3	0.00625287		



Combo View

Model Tasks

Labels & Attributes

Application

- ▼ projeto
 - ▼ Projeto
 - Estutura
 - Alvenarias
 - Vidros
 - Escadas
 - Paisagismo
 - Coberturas leves
 - Passarela
 - Torre peixe
 - Estruturas auxiliares
 - Rodoviaria
 - Section

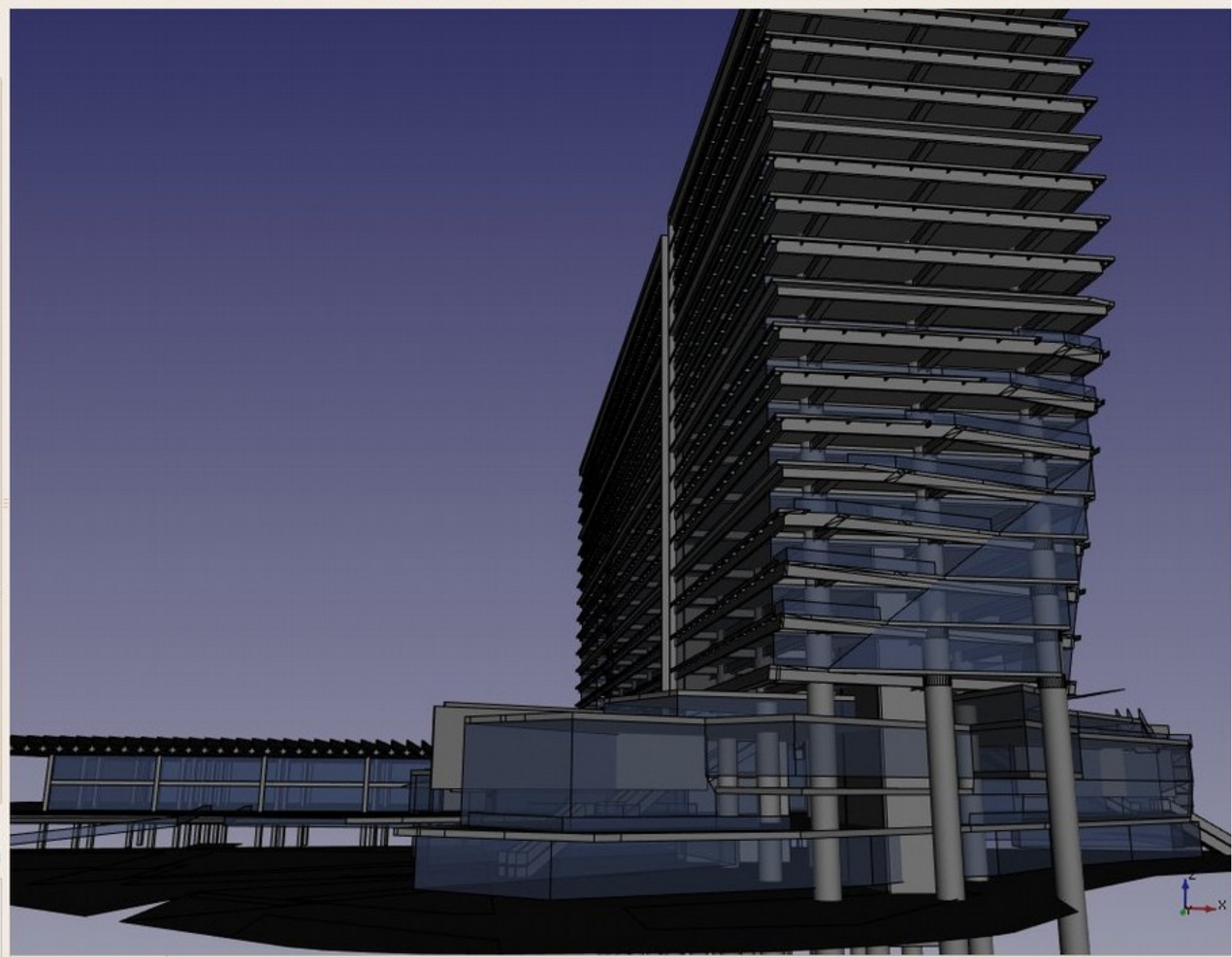
Property	Value
Arch	
Display Size	100 mm
Base	
Display Mode	Default

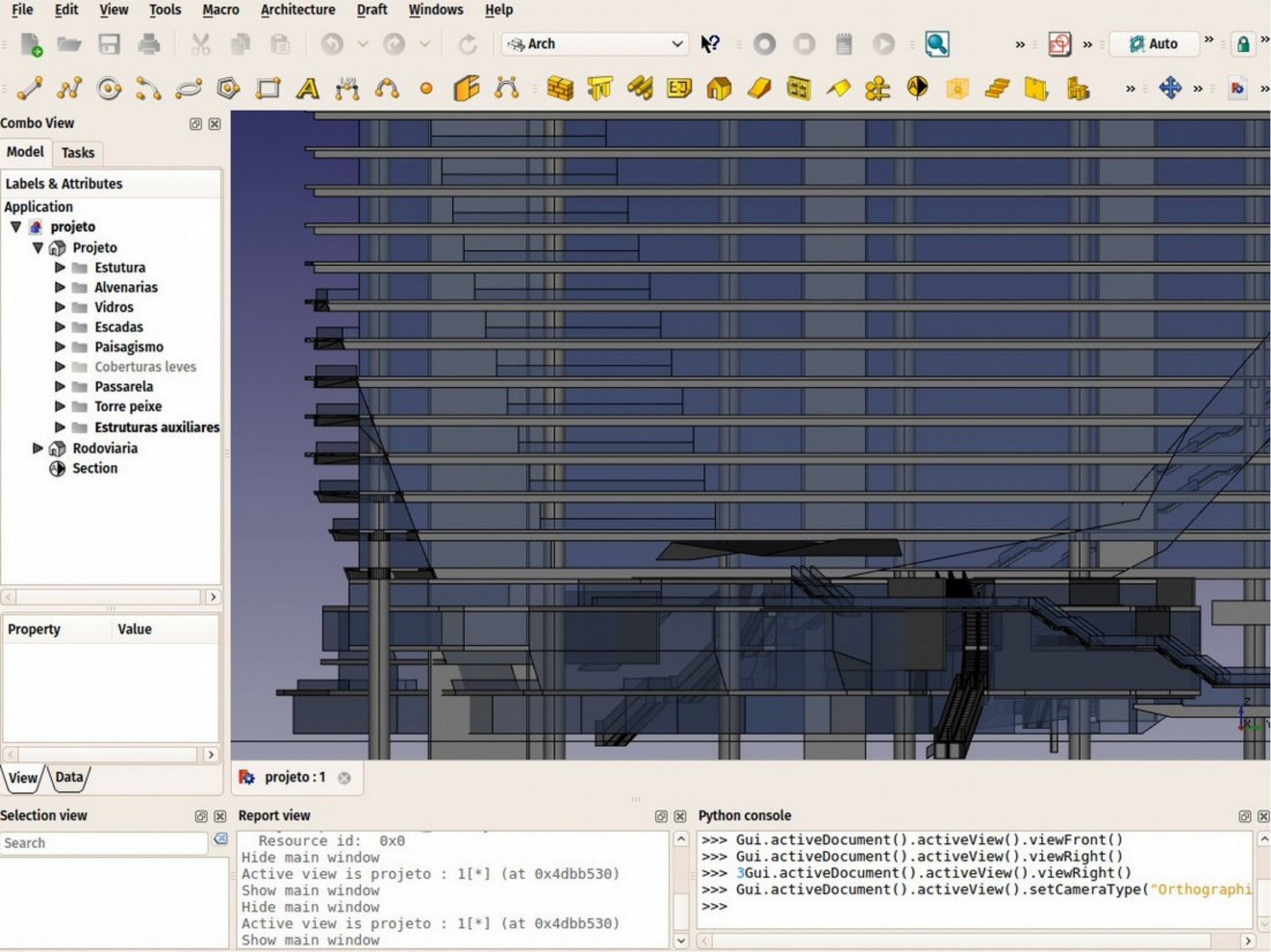
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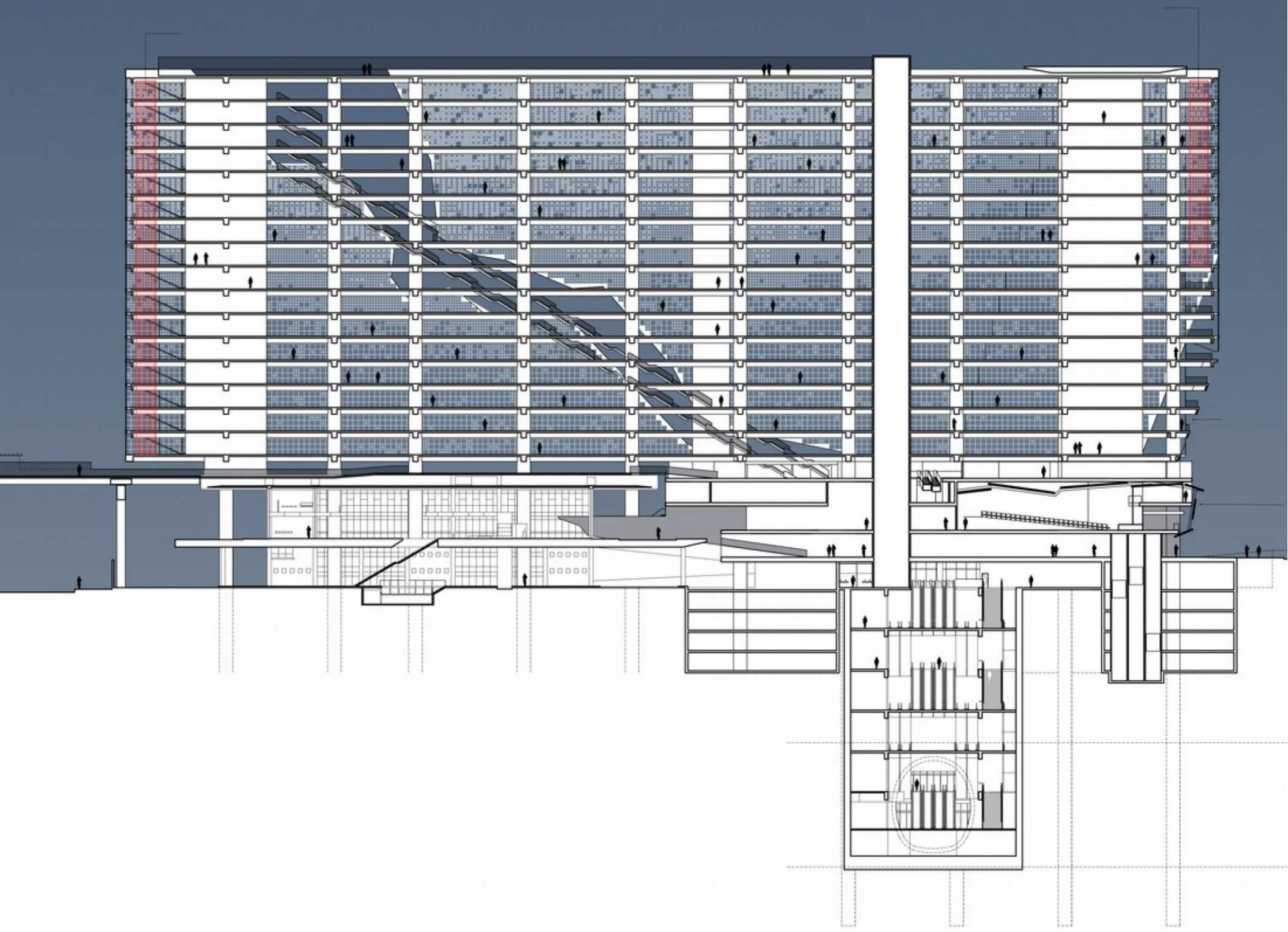
Selection view

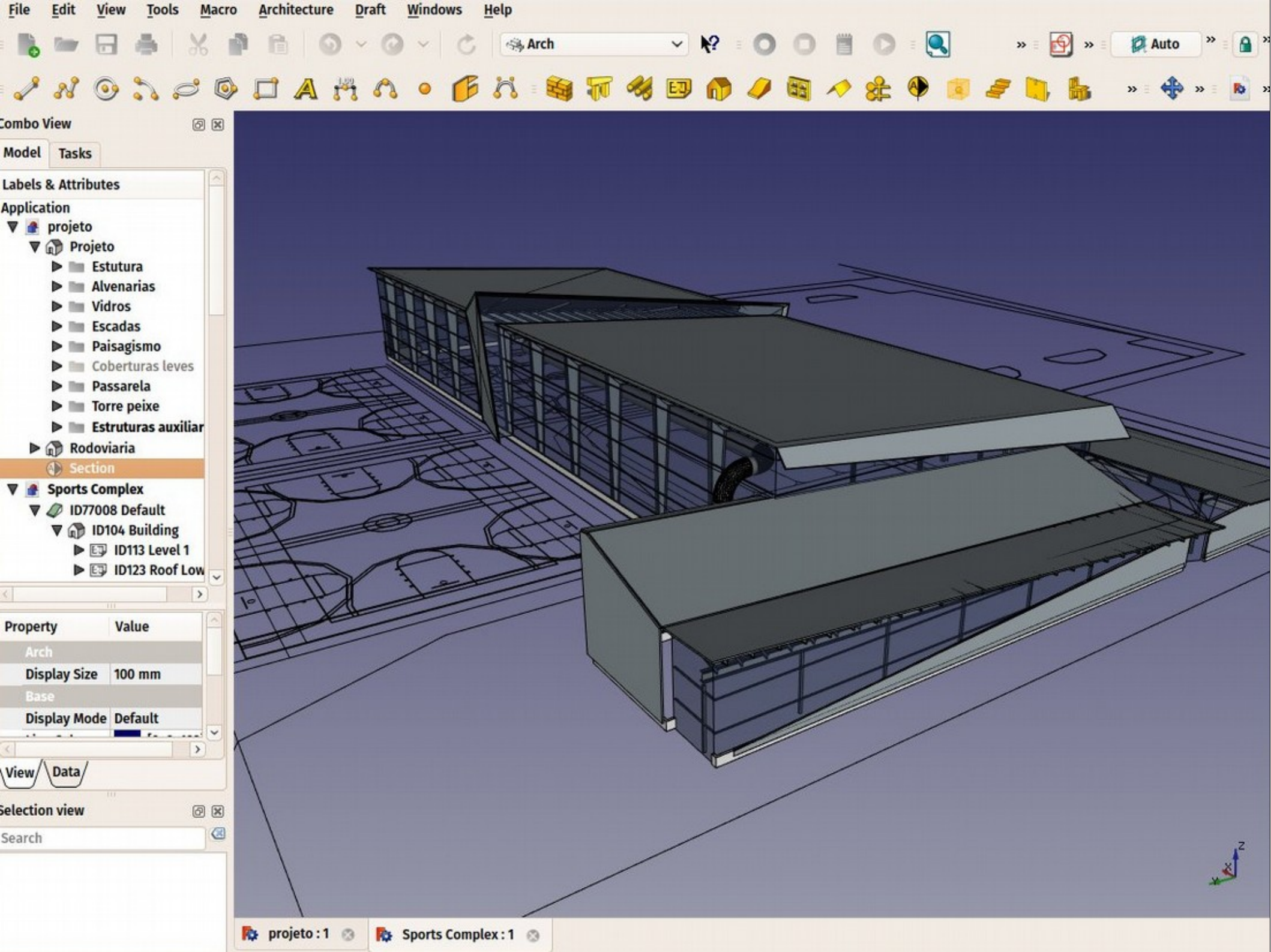
Search

projeto.Section (Section)









Combo View

Model Tasks

Labels & Attributes

Application

- ▼ projeto
 - ▼ Projeto
 - Estutura
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 - Vidros
 - Escadas
 - Paisagismo
 - Coberturas leves
 - Passarela
 - Torre peixe
 - Estruturas auxiliar
 - Rodoviaria
 - Section
- ▼ Sports Complex
 - ID77008 Default
 - ID104 Building
 - ID113 Level 1
 - ID123 Roof Low

Property Value

Arch	
Display Size	100 mm
Base	
Display Mode	Default

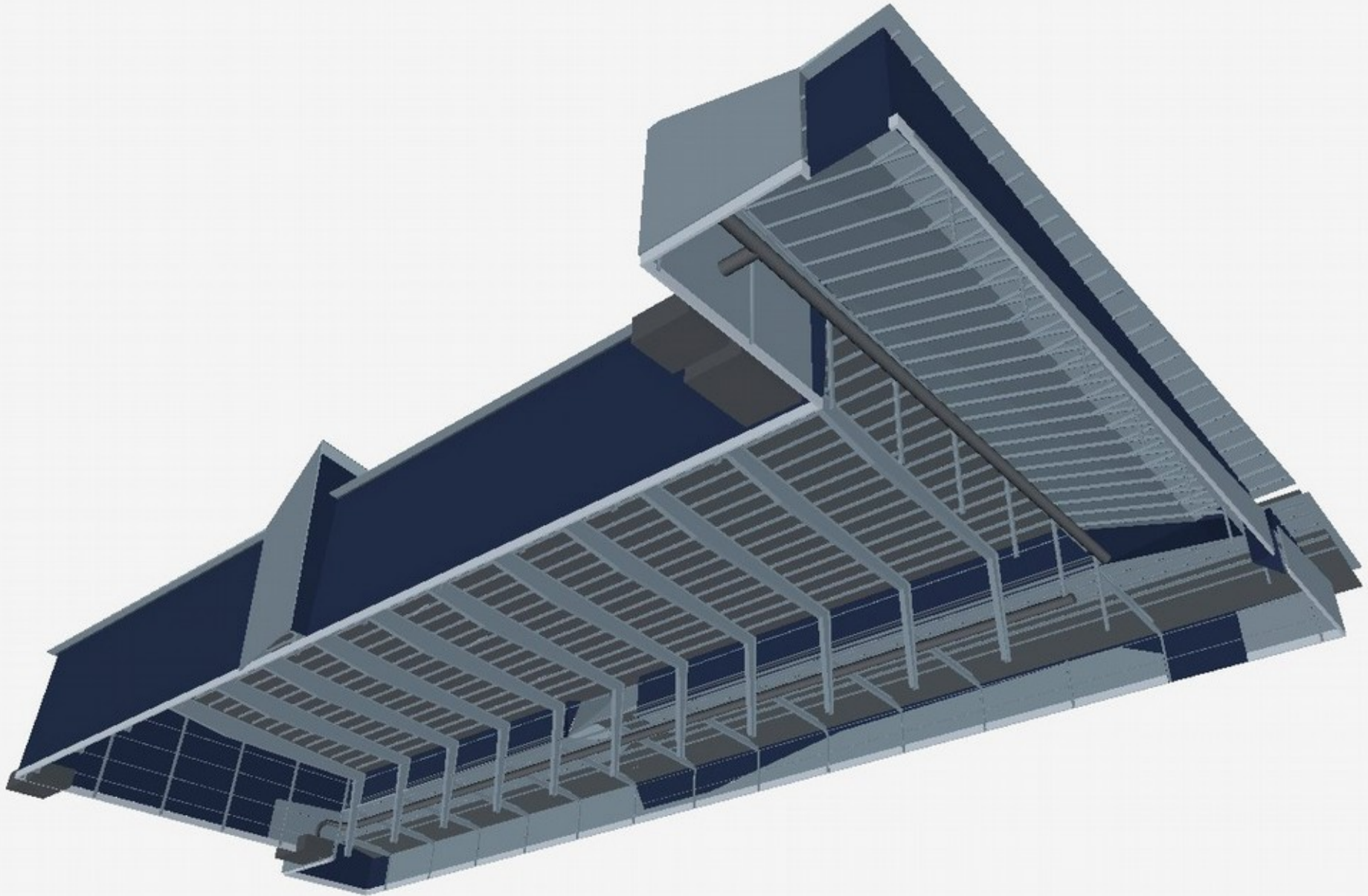
View Data

Selection view

Search

projeto : 1

Sports Complex : 1



Write IFC View

IFC file

Complex.ifc

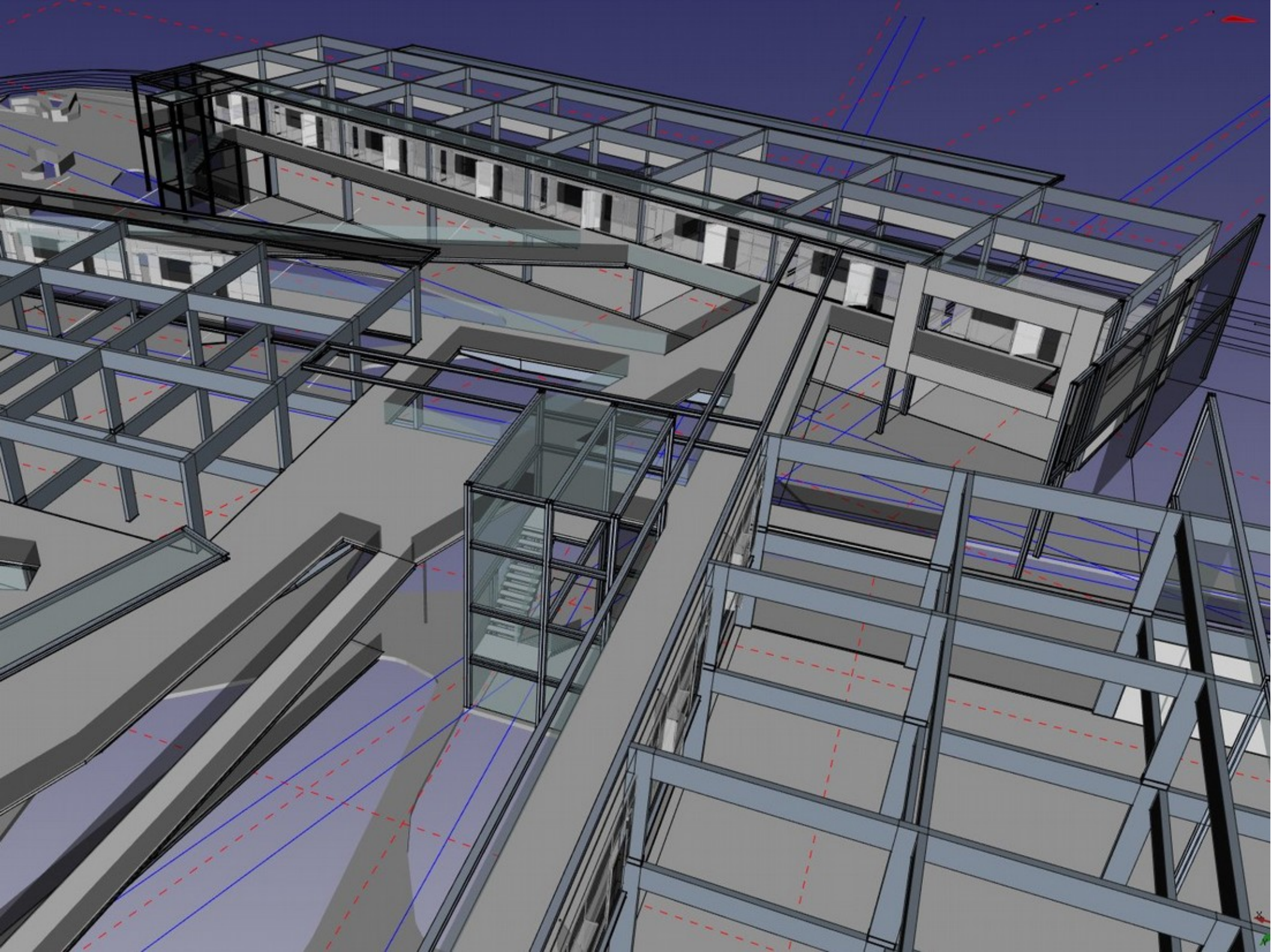
Choose file

Load

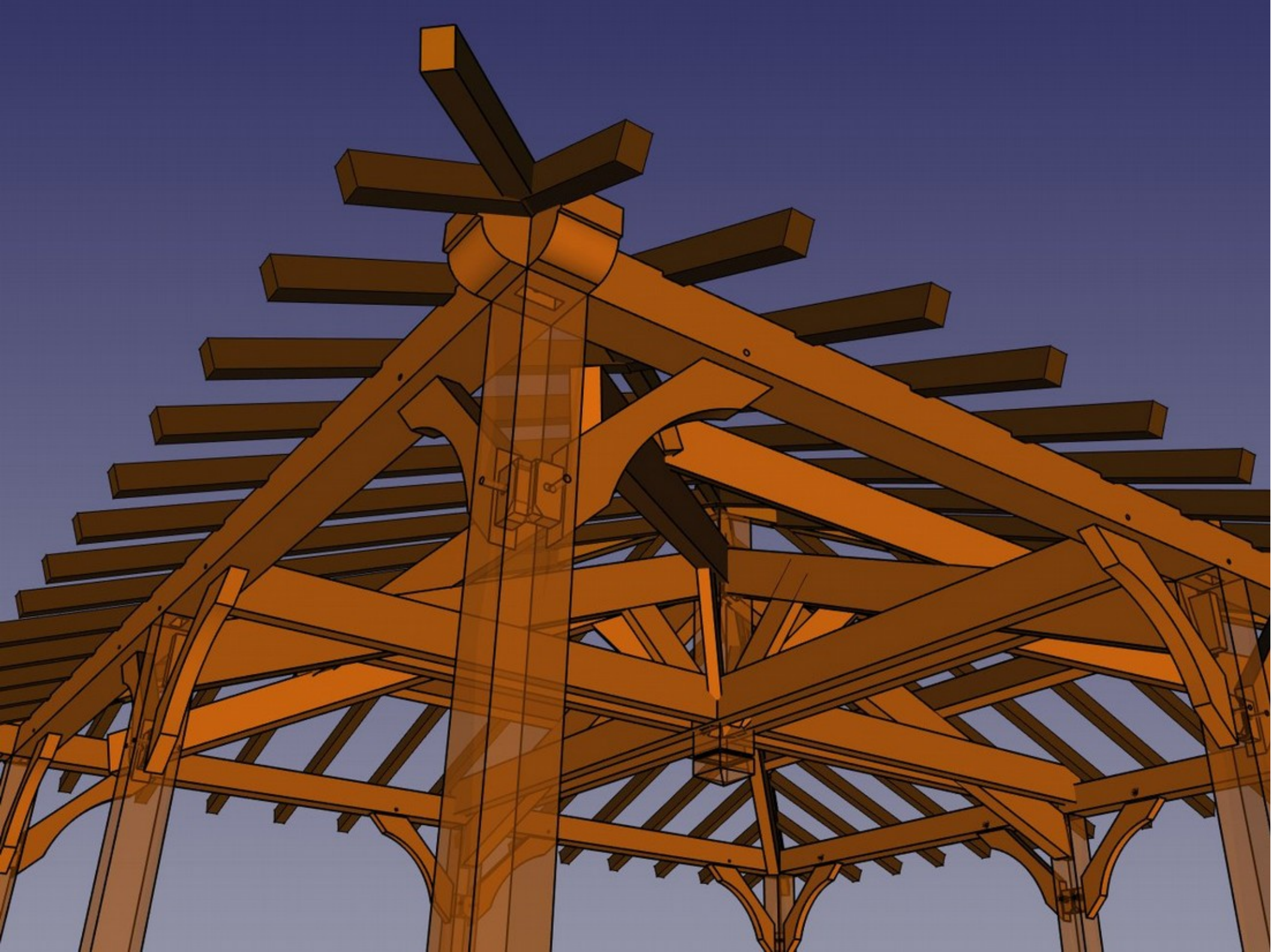
100%

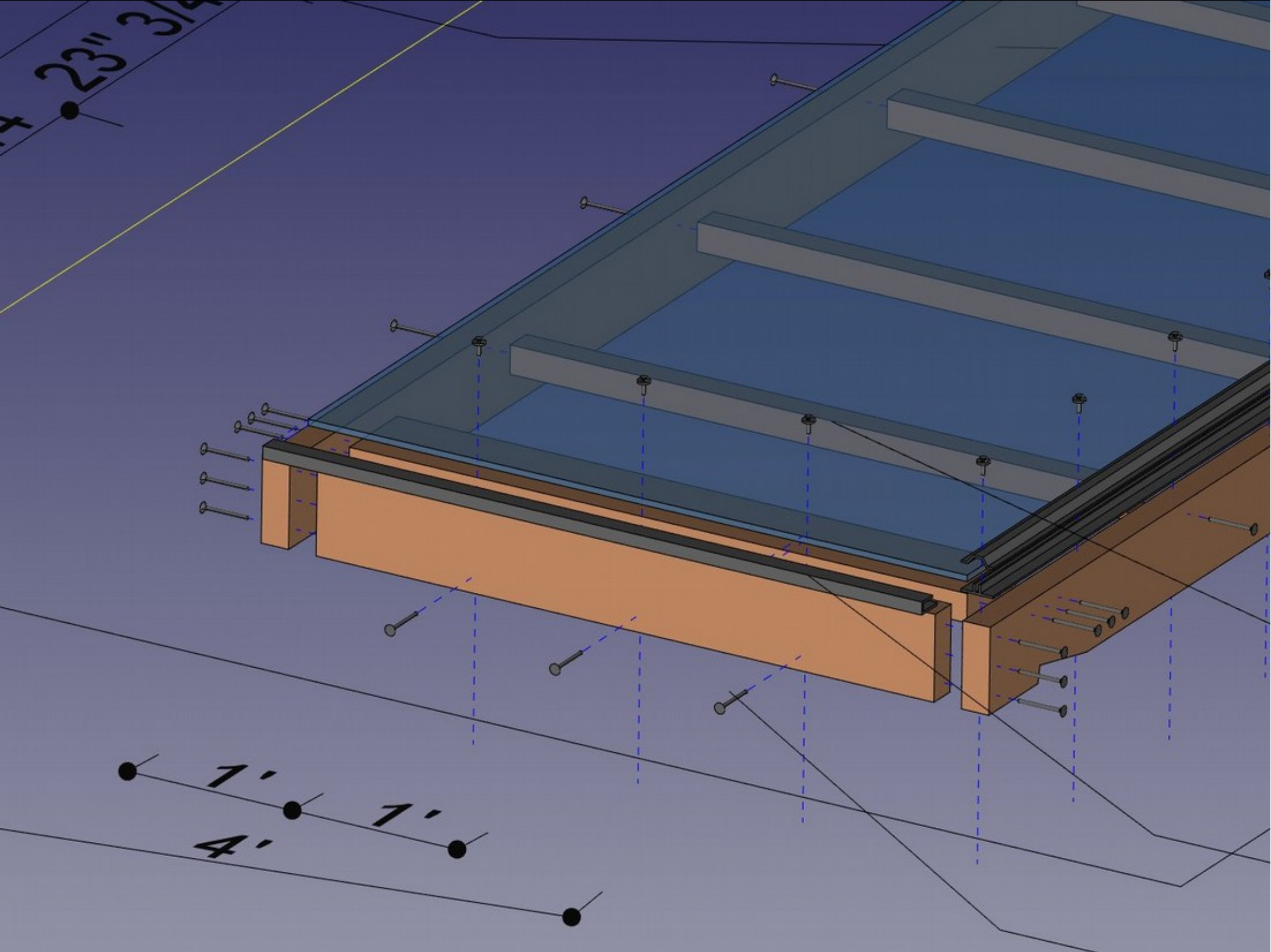
Warning: addClosedPolyhedron: Meshset is not closed, IFC e
#94163=IfcFace
Warning: addClosedPolyhedron: Meshset is not closed, IFC e
#94433=IfcFace
Warning: addClosedPolyhedron: Meshset is not closed, IFC e
#146202=IfcFace
File loaded: 143082 entities in 2945.37 sec.

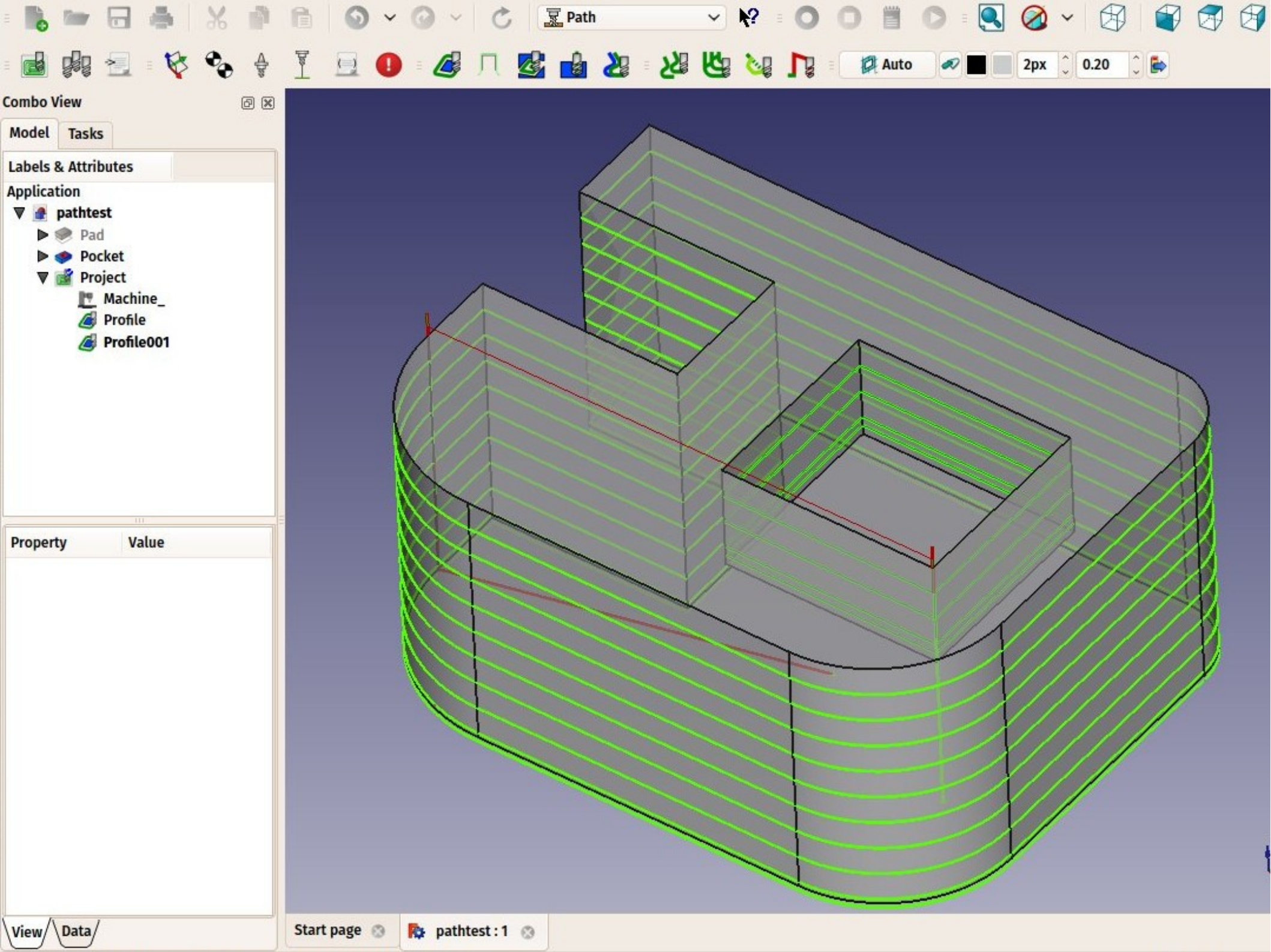
000, 0.000

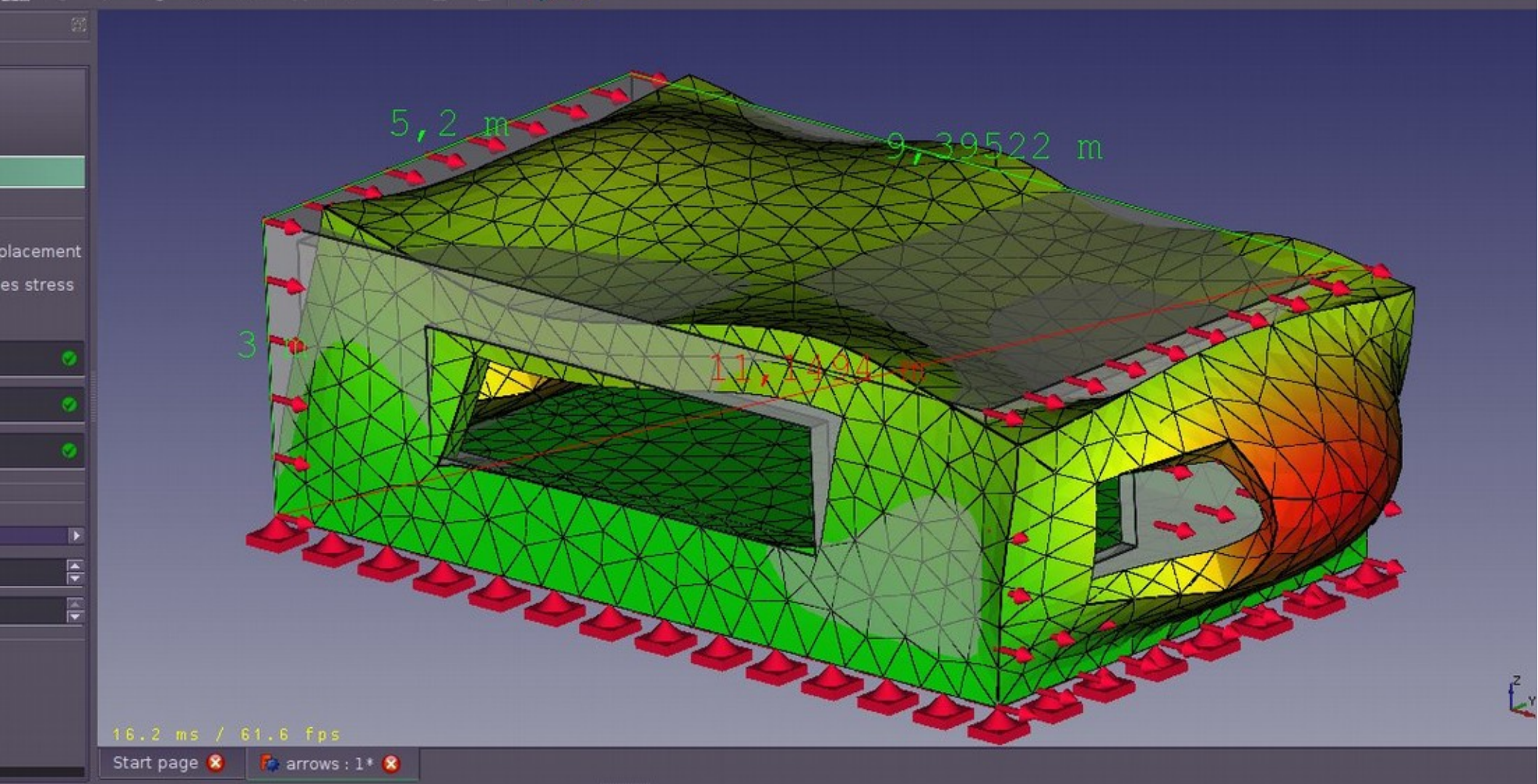


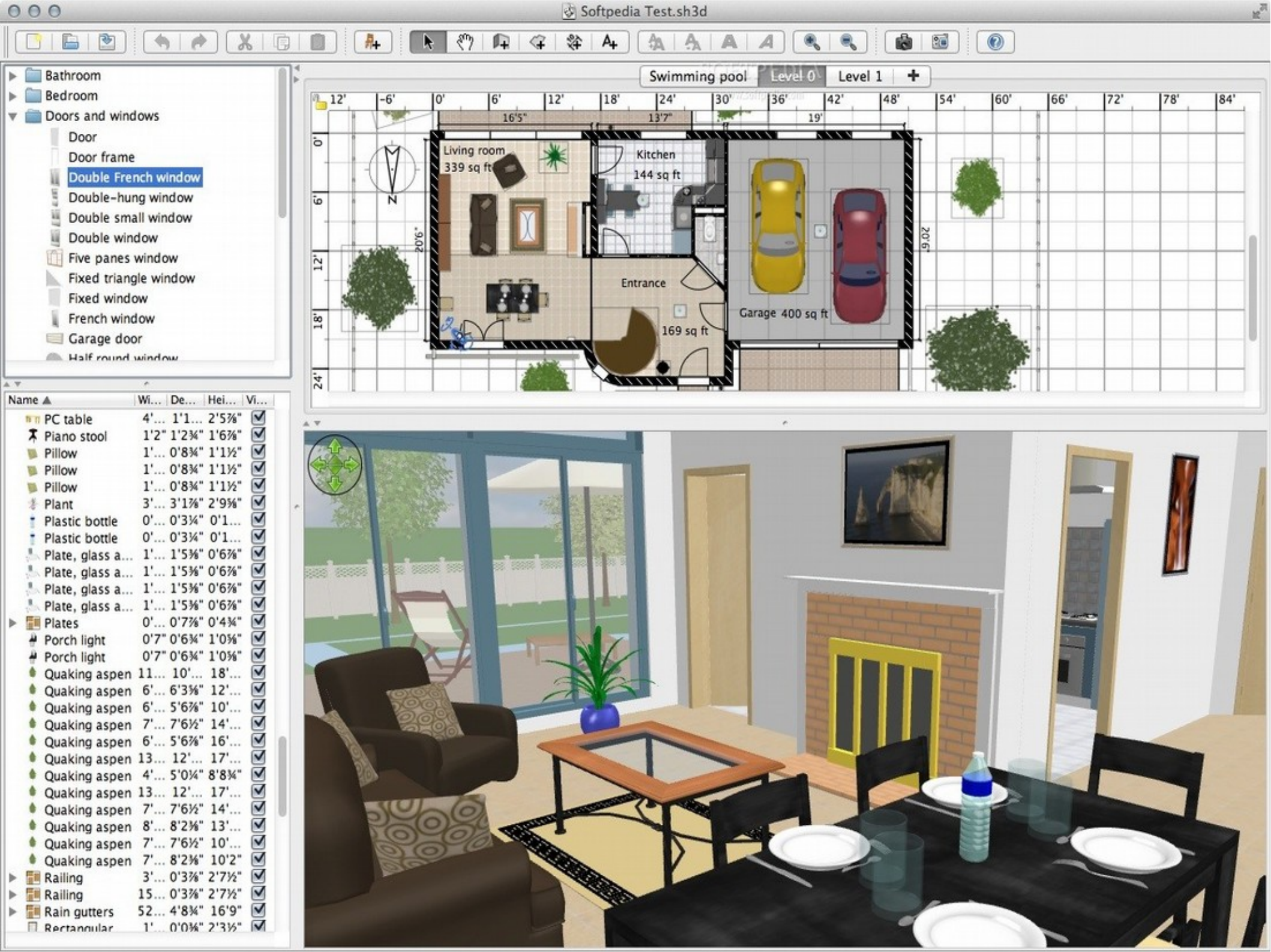




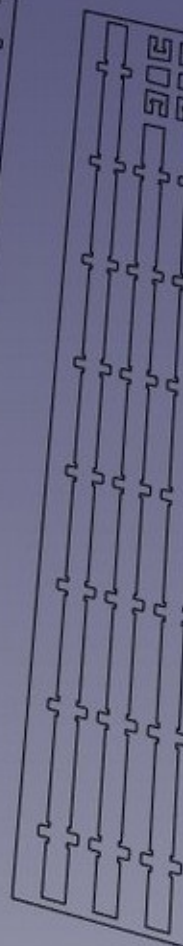
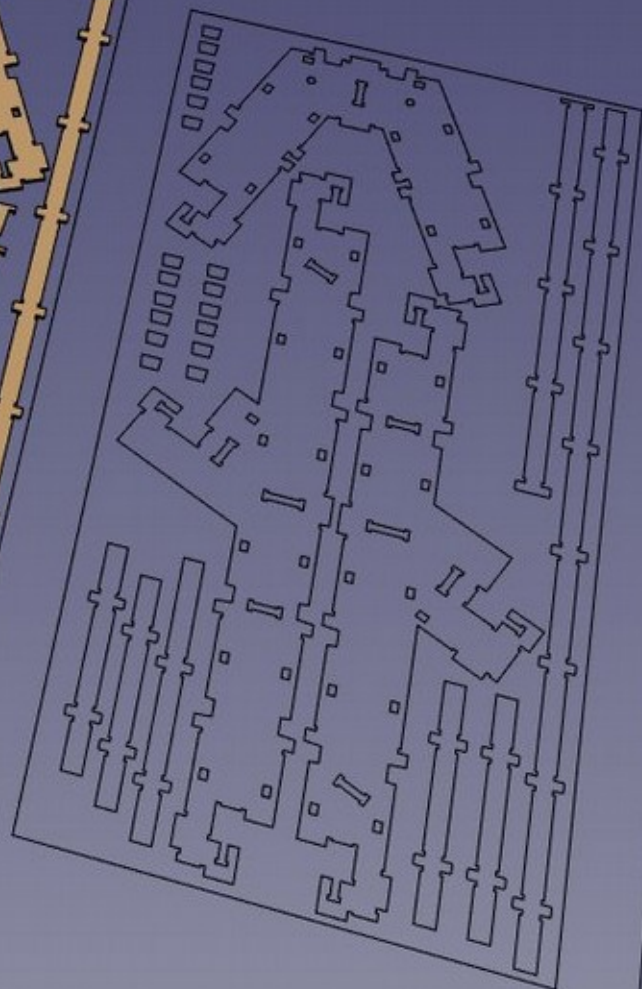
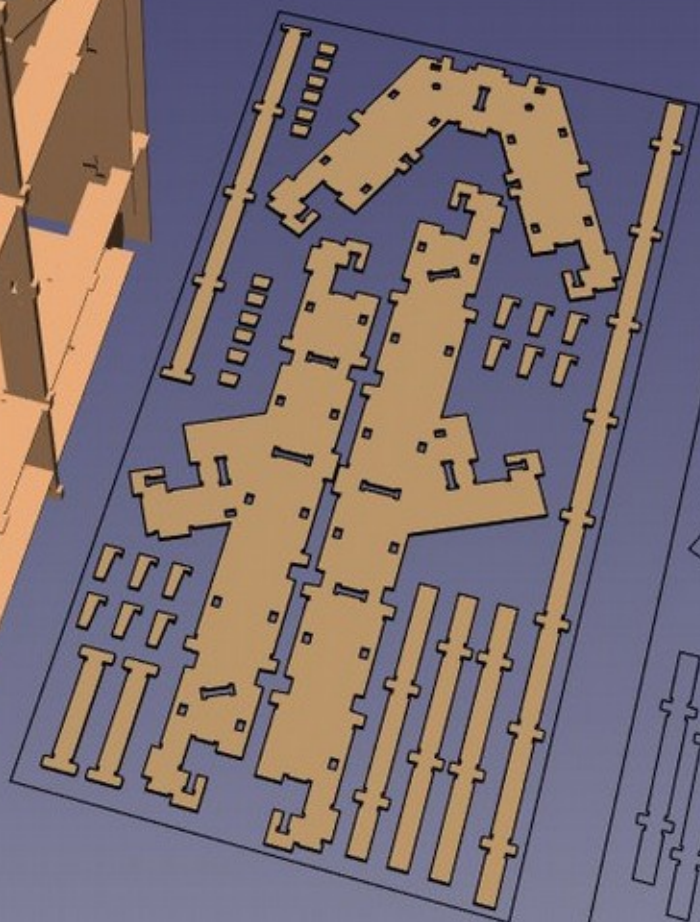
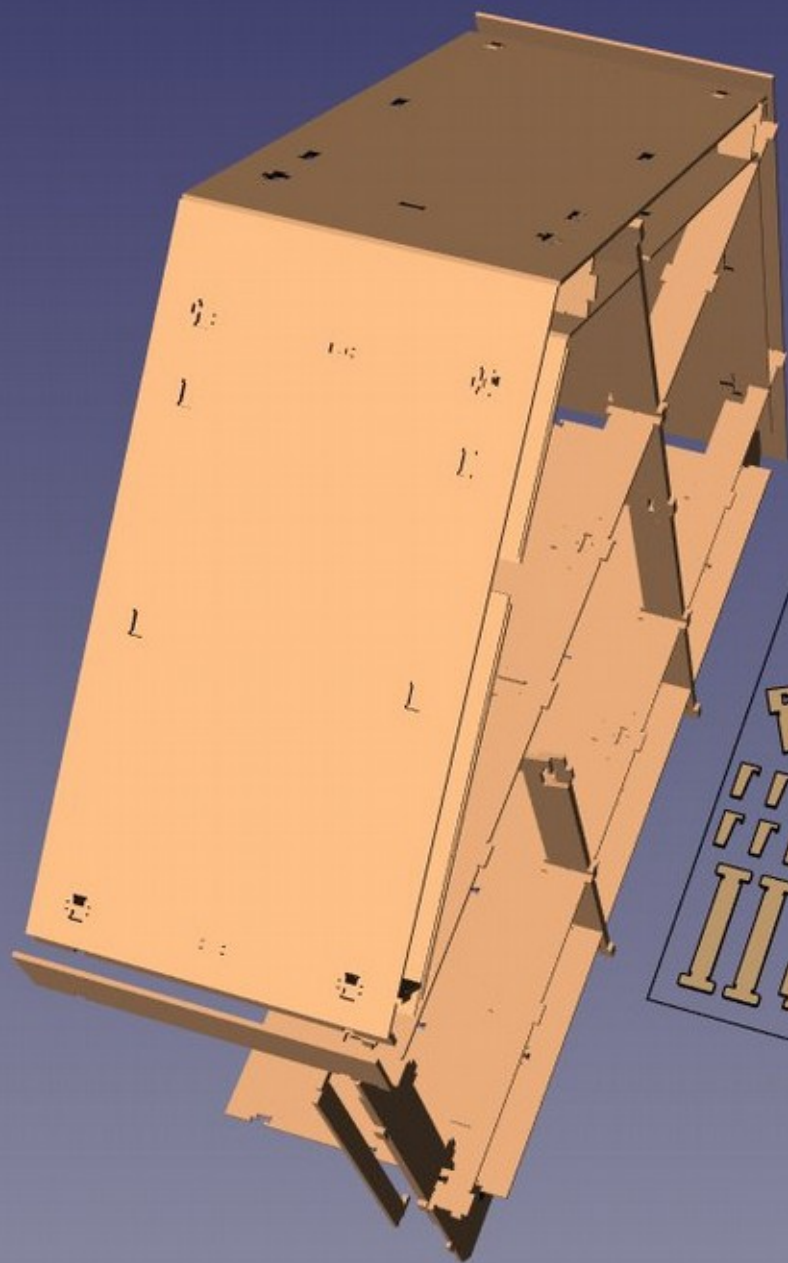












Closing the 2D gap

- Many architects and other actors of a project still work in 2D. So we still need it
- No good open-source solution for our gigantic arch drawings
- But we can reduce the 2D work a lot

The near and not-so-near future

- (Much) more IFC support
- Better automatic tools and presets (windows, doors, walls, beams, etc)
- Structural analysis models
- Direct editing (push/pull)

A 3D architectural rendering of a building's interior and exterior. The model is composed of various geometric shapes, including rectangular rooms, a curved terrace, and a bar area. Dimensions are indicated by lines and numbers throughout the model. The text "That's it, but that's not it" is overlaid in the center.

That's it, but that's not it

Come chat with us!

<http://forum.freecadweb.org>

Blender: <http://www.blender.org>

FreeCAD: <http://www.freecadweb.org>

My site: <http://yorik.uncreated.net>

My email: yorik@uncreated.net

My twitter: @yorikvanhavre