Solid Panel Elements

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Advantages:

- Simple assembly
- Short construction period with prefabrication
- Construction site is dry and clean with less waste
- Material properties of wood: lightweight elements, compressive strength, good heat insulator
- Building as a carbon storage: key to moving the building industry towards sustainability and carbon neutrality

Disadvantages:

- Price (CLT manufacturing units are few in number, resulting in a higher material transportation cost)
- Limited dimensions with the building code restrictions on timber building heights
- A high material transportation cost due to relatively few manufacturing plants
- Lack of universal standards in mass timber construction
- Less long-term flexibility for future renovations

Kajstaden Tall Timber Building

Client: Slättö Förvaltning

Size: 2,400 m² tall building, 7500 m² in total

Year: 2016-2019

Construction: Martinsons og Consto

Engineering: Bjerking

Architect: C.F. Møller Architects

Woodcube

Client: Woodcube Hamburg GmbH

Size: 1,479 m² tall building, 1480 m² in total

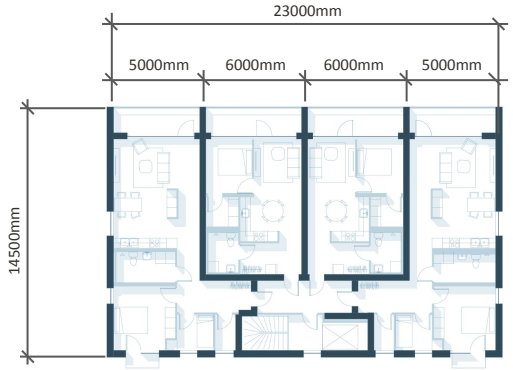
Year: 2012-2013

Construction: Erwin Thoma Holz GmbH

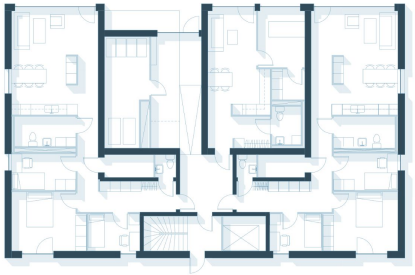
Engineering: Ingenieurbüro Isenmann

Architect: Architekturagentur

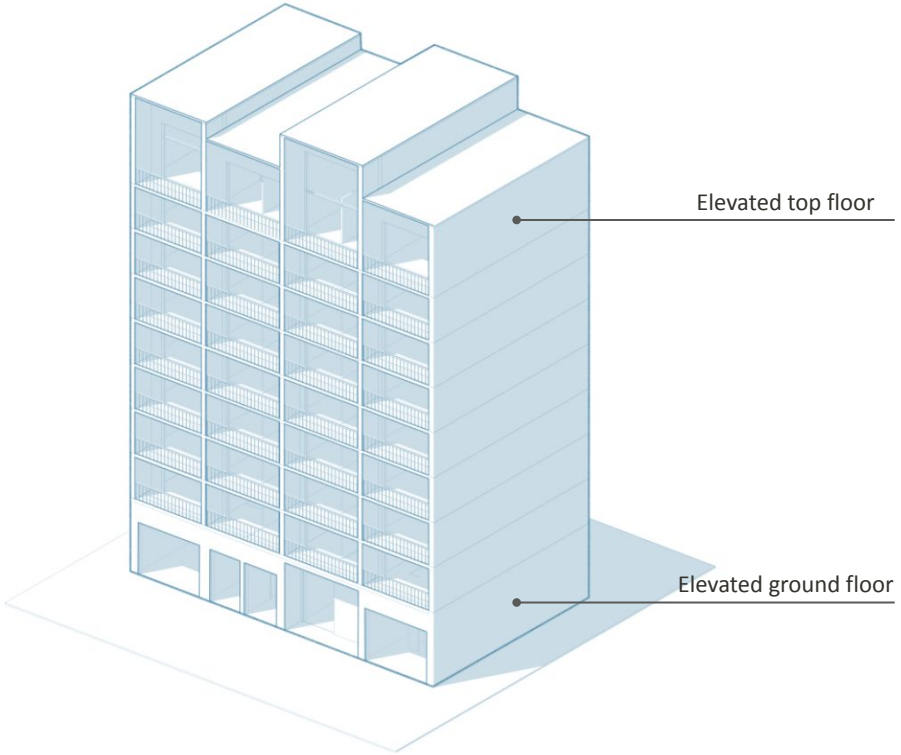
PLAN



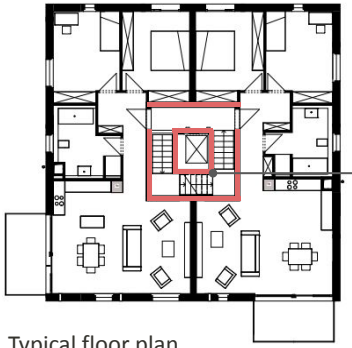
Typical floor plan



Ground floor plan

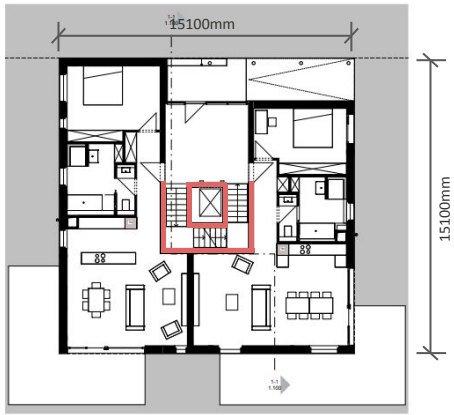


PLAN

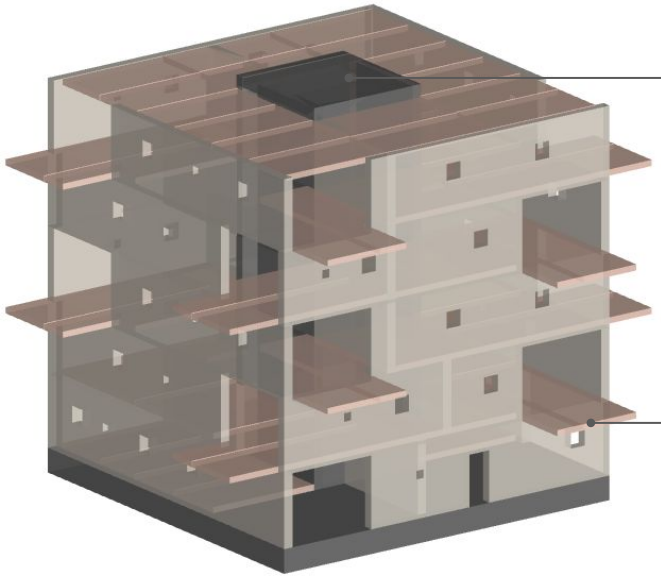


RC core (pink)

Typical floor plan



Ground floor plan



RC core

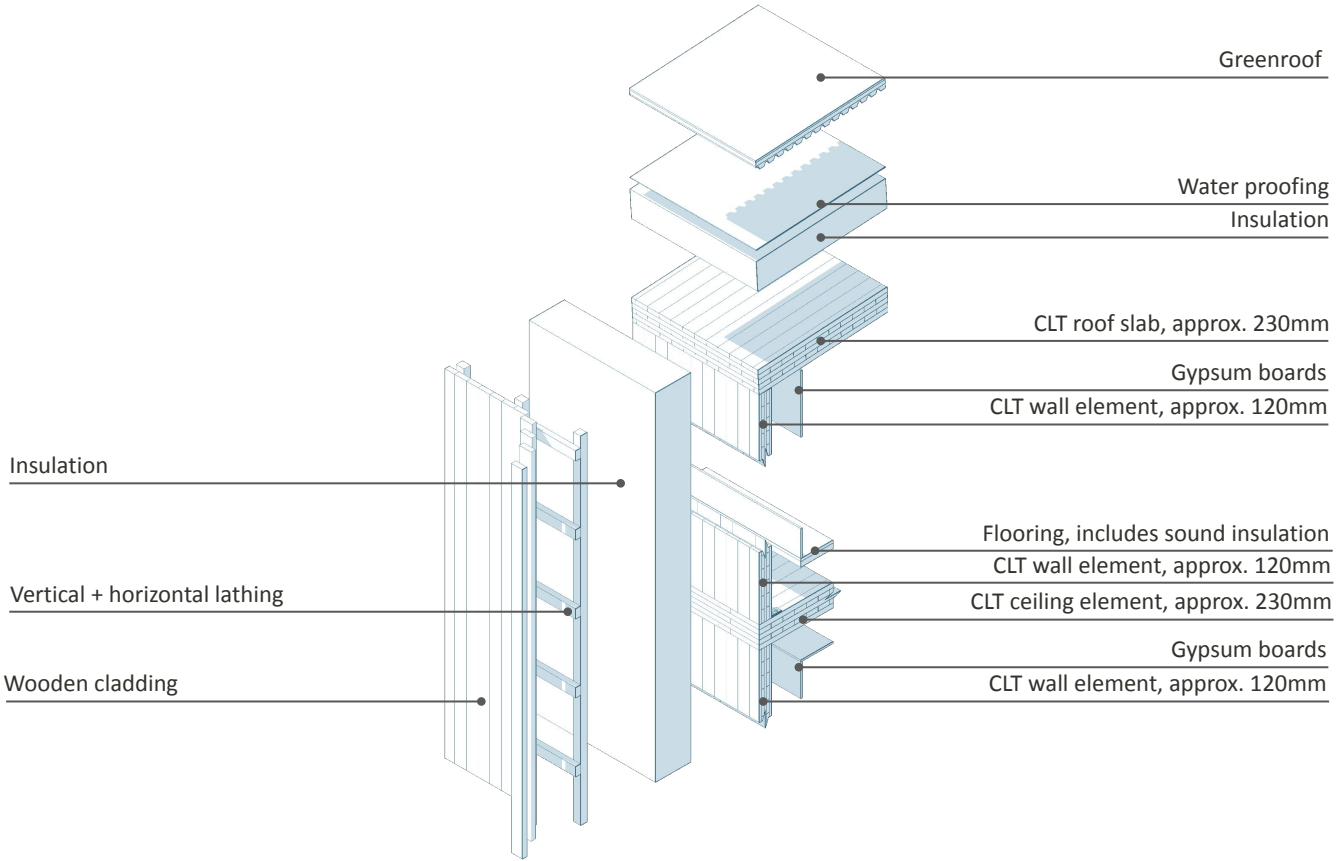
Cantilever

(approx. 2.5m)

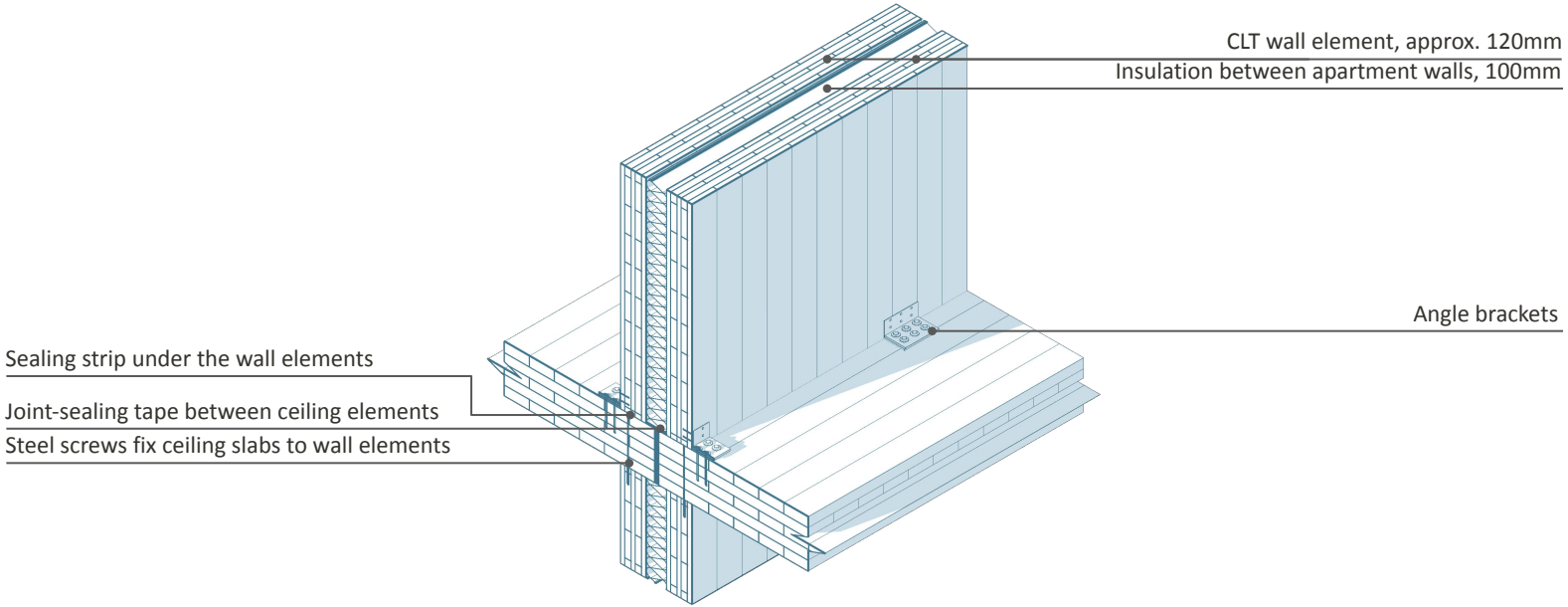
- This building has a concrete core.
- Cross-grained timber similar to CLT (“Thoma Holz100”) is used for walls and floors.

https://www.internationale-bauausstellung-hamburg.de/fileadmin/Mediathek/Whitepaper/14-06-16_White_Paper_WOODCUBE.pdf

Details

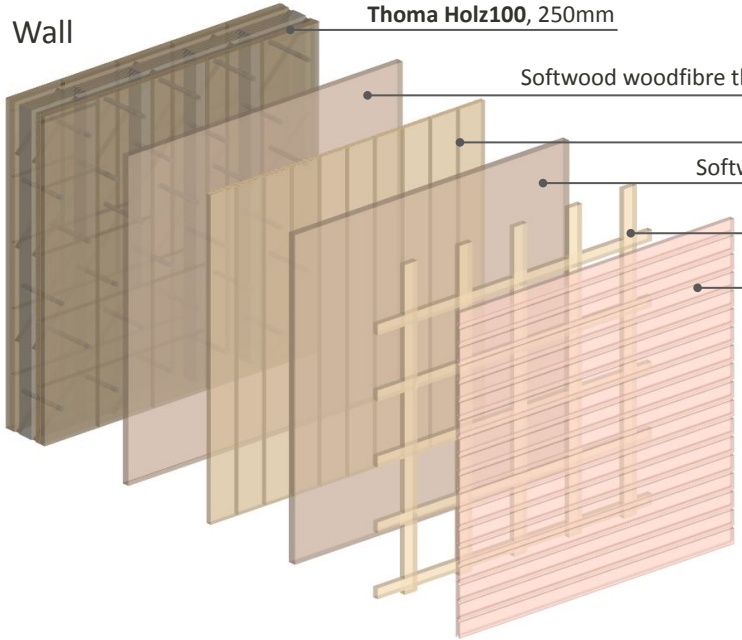

Greenroof
Water proofing
Insulation
CLT roof slab, approx. 230mm
Gypsum boards
CLT wall element, approx. 120mm
Insulation
Flooring, includes sound insulation
CLT wall element, approx. 120mm
Vertical + horizontal lathing
CLT ceiling element, approx. 230mm
Gypsum boards
Wooden cladding
CLT wall element, approx. 120mm

Details


CLT wall element, approx. 120mm
Insulation between apartment walls, 100mm
Angle brackets
Sealing strip under the wall elements
Joint-sealing tape between ceiling elements
Steel screws fix ceiling slabs to wall elements

Details

Wall



Thoma Holz100, 250mm

Softwood woodfibre thermal insulation, 36 mm

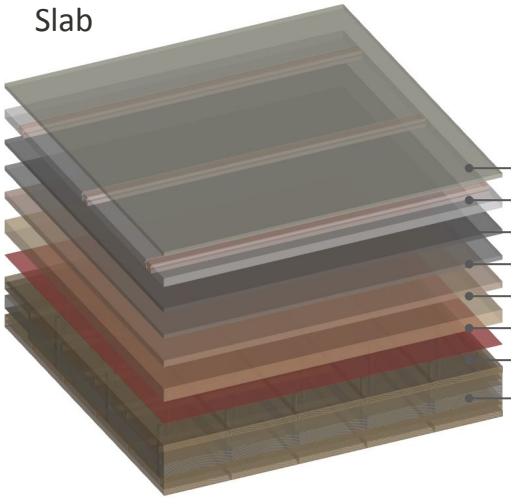
Spruce cladding, 26 mm

Softwood woodfibre thermal insulation, 40 mm

Lathing, with horizontal firebreak, 30mm

Red cedar/larchwood rhomboid cladding, 26 mm

Slab



Oak floor boards, 25 mm

Floor battens and insulation, 25 mm

Cement-based dry screed, 22 mm

Separating layer, cement-based dry screed, 22 mm

Softwood woodfibre impact sound insulation, 33mm

Honeycomb infill, 60 mm

Plastic sheet to prevent spillage

Thoma Holz100 ceiling, 235mm

-No thermal Insulation compasite system

-No membranes

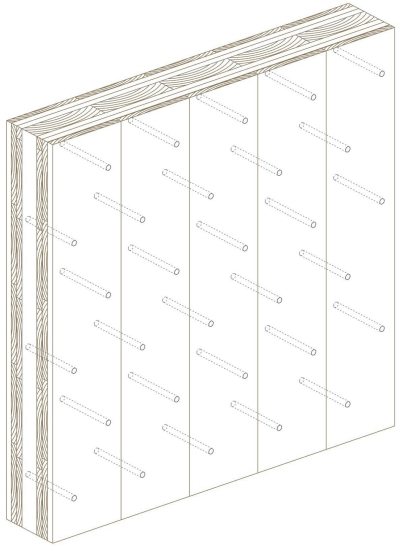
-No glues

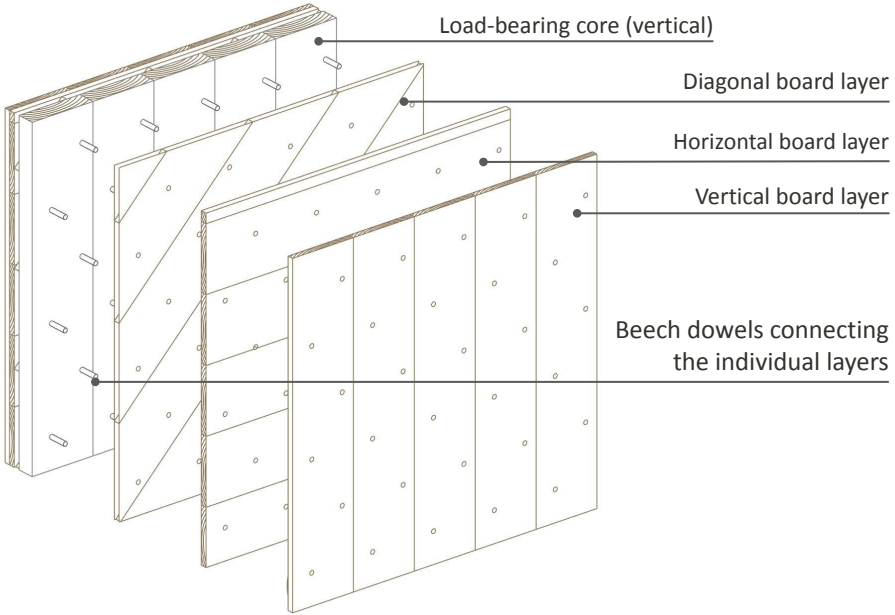
-No fire protection

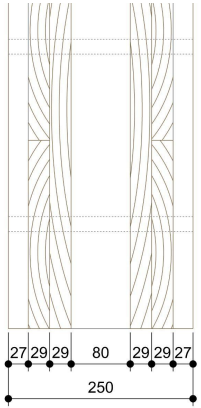
-100% biodegradable

Details

Thoma Holz100

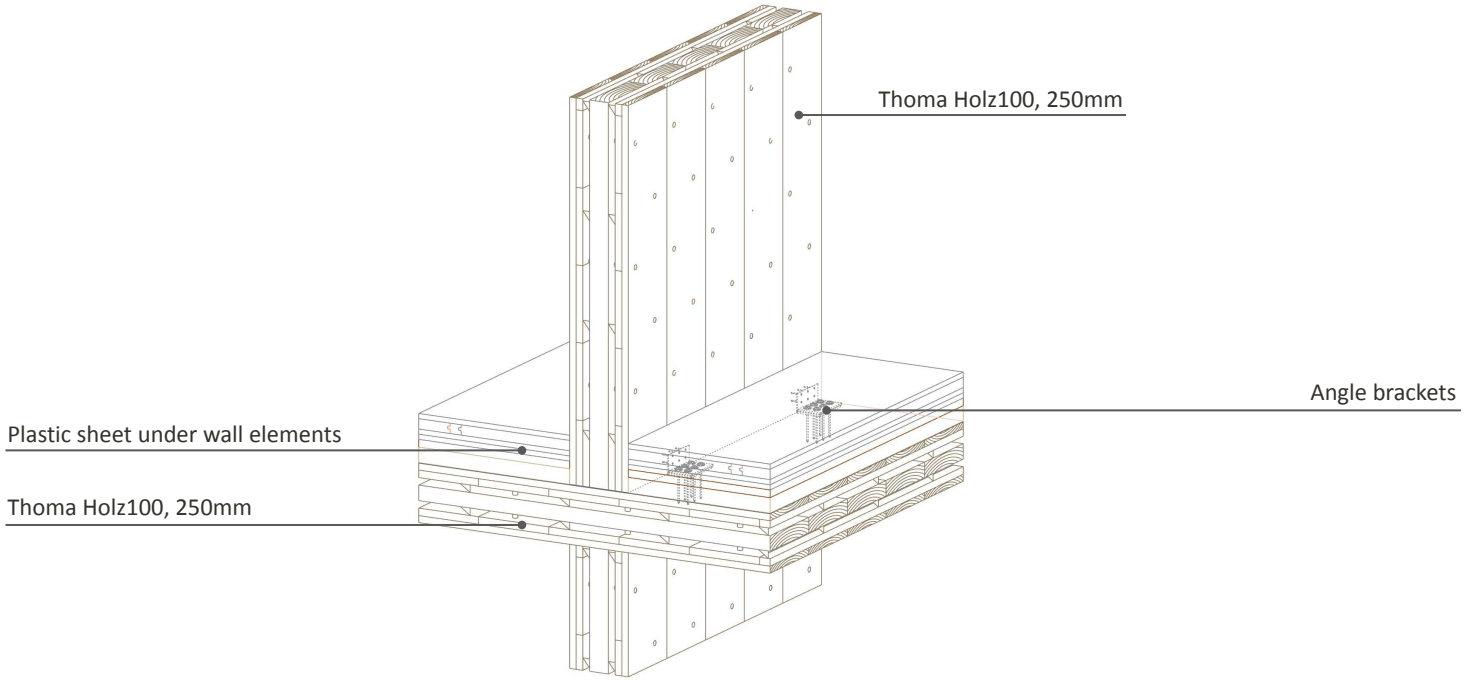






The static load bearing capacity of Wood100 was able to withstand exposure to flames of 900–1000°C for 150 minutes.

Details


Thoma Holz100, 250mm
Angle brackets
Plastic sheet under wall elements
Thoma Holz100, 250mm

Assembly

- It took an average of three days per floor for three craftsmen to raise the frame
- Elements transported with trucks, lifted by crane on site
- Biggest elements size approx. 14500mm x 2750mm x 250mm
- Mechanical joints with screws have been used which makes it easy to disassemble and recycle the building parts
- Limiting factor in the elements' size in this project is limitations caused by transportation
- Elevated floors require two wall elements stacked on top of each other to reach the ceiling height

https://www.cfmoller.com/p/Kajstaden-Tall-Timber-Building-i3592.html

Assembly

- First, a prefabricated staircase was installed

- It took three and a half weeks on the construction site

- Elements transported with trucks, lifted by crane on site

- Biggest elements' size approx. 8000mm x 3000mm x 250mm

- Mechanical joints with screws have been used which makes it easy to disassemble and recycle the building parts

- Limiting factor in the elements' size in this project is limitations caused by transportation

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