StoraEnso

Partner of Stora Enso

Woodeum

Albizzia
Lyon, France

At 53 metres high, the Albizzia Tower in Lyon is among the three tallest timber-frame towers in France. The scheme comprises four distinct buildings totalling over 14,000 square meters, including social housing, commercial spaces, mixed-use areas, and a 16-floor tower, in heart of Lyon, France.

The Albizzia Tower's base includes retail units, entrances, and two floors of offices. The next 13 floors are residential, containing 56 apartments, with a total floor area of 4,858 m² (of which 4,105 m² is habitable). Services are grouped around the central core, creating modular apartments and freeing up facades for better views.

This ambitious development marks a bold step forward in mass timber urban construction for France, showcasing what is possible to create from a kit of parts — Sylva™ by Stora Enso.

Design and Construction

Hardel Le Bihan Architectes won the 2018 competition to design the city block in Lyon's Confluence district. They created a residential and office tower, along with a social housing building.

Insolites Architectures, based in Lyon, completed the development with two more buildings – one residential and one office.

Developers

The tower was developed by our partners, Woodeum and with UTEI. It was built by Le Bras Frères, the expert timber carpenters known for their work on Notre Dame cathedral.

Site and planning

The development authority set high social, environmental, and architectural goals, including durable construction, coherence, low-carbon emission materials and short construction times to avoid disrupting the nearby primary school.

The use of engineered cross-laminated timber (CLT), specifically Sylva™ CLT Floors, Roofs, and Walls provided the necessary strength and durability while delivering a very low carbon footprint and aligning with France's progressive environmental standards (RE2020).

Carbon footprint

The Sylva CLT elements for the entire scheme only generated 166 tonnes of greenhouse gases (CO_2e) to manufacture and 97 tonnes of CO_2e to transport. Compared to the 2,404 tonnes of carbon dioxide that the trees removed while growing and will store in the building, this is a small fraction. Choosing Sylva CLT elements instead of non-renewables avoided 3,606 tonnes of greenhouse gases. Source: Stora Enso Carbon Calculator.

The material choice also facilitated rapid construction and significantly reduced the project's overall construction time by approximately 30%. (Source).

Fire Safety

Fire safety, as with all residential tall tower blocks, requires careful engineering and planning. In August 2019, during the design phase, fire safety regulations were significantly updated. These changes increased the requirements for facades, particularly regarding fire resistance.

All materials used in the facade and balconies had to meet new fire-resistance performance ratings, reducing the combustible mass and minimizing the risk of fire spreading between floors. This complex task required close collaboration between architects, engineers, and Woodeum's R&D team.

Learn more about Sylva Kit's fire performance here.

Off-Site construction

Except for the central core of the Albizzia tower, all mass timber elements were prefabricated off-site, including the base (floor slabs and facades made using slip-forming), timber structure, and UHPFRC facade elements. This approach ensured high-quality fabrication and efficiency in construction.

Structure

The CLT floor plates form a diaphragm around the core, provide horizontal stability to the facades and allow for a simple and clean plan.

The floor slabs are a combination of a timber slab for the diaphragm, a topping for acoustic performance, and a layer of spray-applied fire-resistive coating to meet fire safety requirements (90 minutes fire resistance).

The structural timber does not contribute to the internal calorific mass. A suspended ceiling enhances acoustic performance and conceals cabling. (Source).

Durability

The facades are identical on all four sides, allowing for optimization and prefabrication of elements off-site. Primary columns are spaced every 3.2 to 3.6m, connected by solid Sylva™ CLT elements. Facade elements, including vapor barriers, insulation, waterproofing, and window casings, were added before arriving on-site with factory-controlled precision.

The building went through numerous tests for mechanical robustness, seismic loading, impact loadings, pull-out of anchorages, air- and water-tightness, and wind loading.

To monitor the timber's moisture variations, Woodeum installed connected sensors in the walls during the site phase, continuing until completion and beyond.

Learn more about Sylva™ Services by Stora Enso | Stora Enso

Publications

International Journal of High-Rise Buildings

Learn more about the advantages of mass timber Download the whitepaper (French version)

General

Delivery year

2023

Building type

Multi Residential

Area (m²)

14,836

Storeys

17

Units

114

Products

Products and Services

Sylva™ CLT Floors and Roofs, Sylva™ CLT Walls

Product quality

NVI

Product volume (m³)

3,155

Team

Partner of Stora Enso

Woodeum

Developer

UTEI
Woodeum

Architect

Hardel & Le Bihan
Insolites Architectures

Structural Engineer

Sylva Conseil

Main contractor

Lebras Frères

Specialist Timber Subcontractor

Le Bras Frères