StoraEnso

Prefabricated LVL 3-pin Portal Frame Warehouse Ramsgate, UK

In a groundbreaking collaboration, Paramount Structures Ltd, Stora Enso, and ROE Timber Frame Construction successfully designed and constructed a 30-meter clear span, 60-meter length warehouse. Utilizing prefabricated Sylva™ LVL Beams and Columns, the project achieved a robust structure with a minimal carbon footprint. This project demonstrates the potential to significantly reduce or replace the use of steel in warehouse construction, thereby minimizing greenhouse gas emissions during manufacturing, construction, and transport. The success of this project has led to its inclusion in Stora Enso's premade 'Industrial Building Concepts,' aimed at maximizing raw material and construction efficiency.

LVL is twice as strong as steel (relative to weight) and resistant to extreme weather conditions, corrosion, and fire, ensuring a long-lasting structure that is easy to maintain. (Source).

Design feature includes:

Beams and Columns: connected by three pinned joints. These joints are typically located at the base of each column and at the apex of the roof. This design allows for flexibility and movement.

Rigid Structure: that can support large spans without the need for interior columns. This results in a spacious, open-plan interior, ideal for storage, logistics, and industrial applications.

Benefits

Construction cost-effectiveness: Prefabricated LVL components allow for rapid construction, reducing labour costs and project duration. Approximately 30% faster that concrete and steel.

Maximizing space: The absence of internal support columns optimizes the available area for storage and operations.

Adaptability: Suitable for various applications, that can be adapted over time if a company's needs change.

Materials and Construction:

The Sylva™ Beams used in the project are LVL G 168mm, comprised of LVL S reglued, while the columns are made from standard 75mm LVL X. LVL GS contains only LVL S components without crossband veneers, whereas LVL GX includes LVL X-type components with crossband veneers.

To reinforce the veneer, the grain of the second layer typically runs across the grain at a 90-degree angle. Bolt crowns were pre-drilled offsite, and the ridge connection and base panel connections were drilled on-site.

Carbon Footprint:

).Stora Enso Carbon CalculatorThe Sylva LVL Beams and Columns generated only 14 tonnes of greenhouse gases (CO_2e) to manufacture and 4 tonnes of CO_2e to transport using inland waterways, sea trailers, and last-mile delivery by road. Compared to the 97 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 145 tonnes of greenhouse gases (Source:

Transport Efficiency

Stora Enso employed a multimodal transport approach to minimize emissions, involving:

Inland Waterways: The journey began in Varkaus, with the cargo transported 280 km via the Saimaa Lake system to the Saimaa Kanal, connecting to the Gulf of Finland.

Sea Cargo: The cargo was then loaded onto sea vessels for the journey across the Baltic Sea to the Port of Hull in the UK.

Last-Mile Delivery: The final leg to Ramsgate was by road, with just two just-in-time deliveries due to the lightweight nature of LVL.

Purlins and bracing were cut on-site.

Wood Origins

forests, ensuring that the timber used comes from sustainably managed forests. PEFC is one of the most trusted and widely recognized certifications for sustainable forest management.PEFC-certifiedThe Sylva™ elements were made with wood sourced from

About Paramount Structures Ltd:

Paramount Structures Ltd specializes in sustainable and innovative structural design. They offer bespoke solutions for various projects, including straw bale houses and historic building restorations. Their expertise lies in timber frame construction, integrating modern materials and techniques. Paramount provides comprehensive services such as in-house design, steel fabrication, and transport, ensuring quality and adherence to industry standards from start to finish.

Stora Enso Industrial Building Concepts**Learn more about**

View other industrial warehouses around the world made from a Sylva Kit of parts:

Storage hall

Baytree Nuneaton

SONNENTOR High-bay warehouse

Sveflow

Dafeng Timber Structure Research and Design Center

StoraEnso

Shortlisted Constructing Excellence SECBE Awards 2022 in the Modern Methods of Construction category

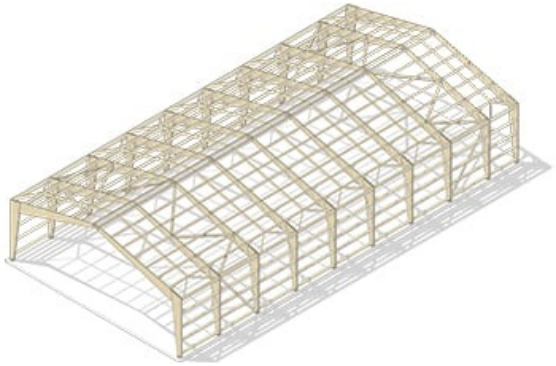

Photo credit: Stora Enso

General

Delivery year

2021

Building type

Industrial

Area (m²)

1,800

Storeys

1

Units

1

Products

Products and Services

Sylva™ LVL Beams and Columns

Product quality

LVL G, LVL GX LVL X, LVL S

Product volume (m³)

118

Number of deliveries

2

Team

Developer

ROE Timber Frame

Structural Engineer

Paramount Structures Ltd

Timber Engineer

Paramount Structures Ltd