



A Walloon company behind a new low-carbon 3-in-1 construction system

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Paille-Tech, a company specializing in the prefabrication of load-bearing walls made of wood, straw, and clay, has developed 12-meter-high facade walls, equivalent to 3 stories! This is a first in the construction world and for Paille-Tech, which took on the challenge of creating these elements for a building project in Luxembourg. This "all-in-one" system allowed the building to be enclosed in 8 days.

For this unique construction, Paille-Tech, located in Floreffe, designed gigantic curtain walls forming the building's envelope. These prefabricated elements are made of solid wood for their structure, compressed straw for insulation, and clay for the interior finish.

Each element measures **12 meters high** and 2.20 meters wide. To lift these wall sections, each weighing over 5 tons, a lifting system had to be developed by Paille-Tech in collaboration with the general contractor.

In total, **1,100 m²** of walls were produced and attached to the building's frame.

Thanks to this technique, the concrete skeleton of the future office building was covered with its protective envelope in 8 days, a record for a building of this size.



Picture Paille-Tech

A Namur-based solution

For this project, **Paille-Tech** produced in its Franière (Floreffe) workshop a total surface area of elements equivalent to that of about ten houses.

"We are proud that our small company was able to take on this challenge," explains Julien Lefrancq, construction entrepreneur and administrator of Paille-Tech. "This innovation required a lot of thought to adapt the workshop to the size and number of walls to be prepared. We also had to develop lifting tools that did not exist for this type of wall. This represented many challenges in terms of personnel, logistics, and handling. But it was stimulating because it opens up new perspectives for designing facades of large buildings with eco-materials."

Energy efficiency and circular construction

The construction is based on the principles of the Austrian 22-26 concept. In this type of passive and bioclimatic building, the temperature is constantly and naturally maintained between **22 and 26°C** without mechanized heating, air conditioning, and ventilation systems.

This large-scale eco-construction project is all the more remarkable as it is intended to house the headquarters of a road and infrastructure company, which is more accustomed to using concrete massively! Just like the general contractor in charge of the project, DZ Construct.

*"We had never done eco-construction before," says Francis Schwall, project coordinator at DZ Construct, "but with the support of Néobuild, the Luxembourg technological innovation hub for sustainable construction, we wanted, with the project's architectural firm AU21, to push the 2226 concept as far as possible by integrating the principles of **modularity, healthy and bio-sourced materials**. The concrete was prefabricated on-site to optimize its use and reduce its needs. Moreover, the building is mostly **dismantlable**."*

For the **Eco-construction Cluster**, this project once again demonstrates that alternatives to "all concrete-polyurethane" exist, and that **solutions** are available to reduce the environmental footprint of the construction sector.

*"The project also shows that Walloon companies have the know-how, capacities, and potential to participate in the **sector's transition** by favoring construction processes and materials that are more respectful of health and the environment, while promoting the local economy and jobs," says architect Anne-Michèle Janssen, director of the Eco-construction Cluster.*

Key elements of the project:

- Passive bioclimatic building concept 22-26
- Optimization of concrete for columns and beams
- Curtain walls made of wood-straw-clay for facades
- 20% of thermal inertia provided by clay
- Energy autonomy for air conditioning, hot water production, and electricity
- Additional heating by air/air heat pump for winter support
- Recycled substrate for roof greening
- Geo & bio-sourced materials (wood, straw, clay)
- Reuse (sanitary facilities, office furniture, lighting, and other materials in the project)

Partners: :

- Project owner: Dellizotti
- Architectural firm: AU21 - Yvone Schiltz & Associates
- General contractor: DZ Construct
- Project management and concepts assistant: Neobuild
- Construction company for facades: Paille-Tech with engineering firm AAIA Brussels
- Structural engineering firm: Athena Engineers
- Special techniques engineering firm: Betic Engineers-Consultants, Part of Sweco
- Energy performance certificate & carbon assessment: MBauen

Who is Paille-Tech?

Paille-Tech is an innovative construction company using natural materials: wood, straw, and earth. Since 2009, Paille-Tech has been providing individuals and builders with modular load-bearing panels made of wood, insulated with compressed straw, and finished with clay plaster. These prefabricated panels are then assembled on-site to form the walls and roof of the building. The company is the only one in Belgium to construct buildings whose structural work is delivered with its interior plaster already applied. The Paille-Tech team consists of about twenty workers, all cooperators of the company, under the regular supervision of a volunteer board of directors.

Who is the Eco-construction Cluster?

The Eco-construction Cluster is a network of nearly 300 reference experts in Wallonia, serving the construction and renovation of healthy, comfortable, less energy-consuming, and less resource-consuming living and working spaces. This group is recognized by the Walloon Region and by the Sustainable Building Network, led by Ademe, the French agency for ecological transition.



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