



Case Study

Ysgol Gymraeg, Welshpool



Case Study

Project Name

Ysgol Gymraeg

Location

Welshpool

Project Type

Education

Specification

Passivhaus





The Project

Ysgol Gymraeg Y Trallwng is a unique project which unites a historic grade II listed building with a modern state of the art Passivhaus extension with adjoining link corridor. This will merge a primary school's rich heritage with modern design principles, led by ecological architecture practice, Architype.

Commissioned to help Powys County Council meet its ambition to reduce carbon emissions to net zero as part of their effort to tackle climate change. Lowfield Timber Frames designed, manufactured and installed a Larsen Truss system for the development.

The flagship £7m Passivhaus development is the first hybrid scheme in the country which incorporates a passive building with a linking corridor to an existing non passive building, merging the primary school's rich heritage with modern design principles.

The Details

0.49 ach

Airtightness @50 pascals

0.09

W/m²K
U-Value achieved

390 mm

Larsen Truss frame

1056 m².

Size of development





Scope of Services

Lowfield Timber Frames specified precision-engineered timber for the design, manufacture and installation of the Larsen Truss system to allow for maximised insulation. Certified timber products minimise carbon footprint (and associated heating costs) when integrated into sustainable building solutions, achieving robust insulation and airtightness. The timber frame designed for this project promotes the council's aim for carbon reduction.

This project was part of Powys County Council's 21st Century Schools and Education Programme. Some of the key aims of the project were to reduce the number of poor condition school buildings and to reduce running costs to maximise resources available to target improvements to learner outcomes. Therefore, energy consumption and building running costs were extremely important to the project.

The wall thickness is increased to provide a fabric first approach with increased insulation. This is achieved by using a lightweight external frame with a breathable wood fibreboard attached, this is suspended from the internal structural frame with slim, compressed timber webs to minimise thermal bridging.



Outcome

The fabric first approach involves carefully considering the design and construction of the building envelope to lower the buildings energy consumption. Principles and measurements such as airtightness, U-values and thermal bridging can all be influenced by wall thickness, insulation type and thickness as well as material choice for example, stud size, OSB boarding and airtightness tape.

Measured by monitoring how often the air pressure changes within one hour, Passivhaus standards allow for a maximum of 0.6 air changes per hour. The air tests on the school revealed just 0.49 air changes an hour, which is a great result.

Certified timber products, such as the Larsen Truss system have been designed for optimal insulation and airtightness, as well as to meet low energy targets, therefore reducing the need for heating, and – by extension – heavy costs.

The project achieved U-values of 0.09 W/m²K for the walls, securing optimal airtightness. The compressed timber web reduces thermal bridging, leading to minimised heating costs.

The school will be encouraged to assess their energy use when the building is first occupied and then annually to ensure that they are benefitting from the anticipated recurring savings in energy costs.



“We chose Lowfield Timber Frames, based on their experience of delivering the Larsen timber frame solution on previous Passivhaus projects and with the target of achieving the stringent thermal properties and the Passivhaus standard air permeability figure of 0.6.”

“The installation went very well and Lowfield carried out their work in a professional and safe manner and was completed as per the agreed programme. Communication with the team has been great and I have been informed on the progress of the project at every stage.”

- Huw Davies Project Manager at Wynne Construction



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Client

Powys County Council

Main Contractor

Wynne Construction

Architect

Architype



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