THE LONG BARN – HERTFORDSHIRE

Passivhaus-Principle Self Build Home

Project: The Long Barn

Location: Hertfordshire

Company: Timber Innovations Ltd

Sector: Self Build

Technology: Timber Frame

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The Long Barn is a single-storey self-build home in Hertfordshire designed to combine contemporary living with low-energy construction principles. Delivered by STA member Timber Innovations, the project was developed as a sustainable long-term family home using offsite timber frame construction and Passivhaus design principles. The design was carefully developed to respond to the surrounding setting while respecting the character of a nearby Grade II listed building.

The structural system uses offsite-manufactured timber frame components designed to create a highly insulated and airtight building envelope. The project incorporated hybrid wall systems filled with wood fibre insulation alongside triple-glazed windows, mechanical ventilation with heat recovery (MVHR) and thermal bridge-free detailing. These measures were designed to minimise heat loss, reduce energy demand and support strong internal air quality throughout the home.

Passivhaus principles formed a key part of the project approach, with the thermal envelope carefully designed to improve the overall energy performance of the building. Timber frame construction enabled the precision required to achieve high levels of airtightness and insulation continuity while supporting efficient offsite manufacture and on-site assembly. The use of natural insulation materials also contributed to reduced environmental impact and improved indoor comfort.

Projects such as The Long Barn demonstrate how timber frame construction can support the delivery of high-performance self-build homes with low operational energy demand. By combining offsite manufacturing, sustainable materials and fabric-first design principles, timber systems provide a practical route to creating energy-efficient homes tailored to individual requirements and long-term living.