

Case Study

Little Barn, Fordingbridge

LOWFIELD
TIMBER FRAMES

Case Study

Project Name

Little Barn

Location

Fordingbridge

Project Type

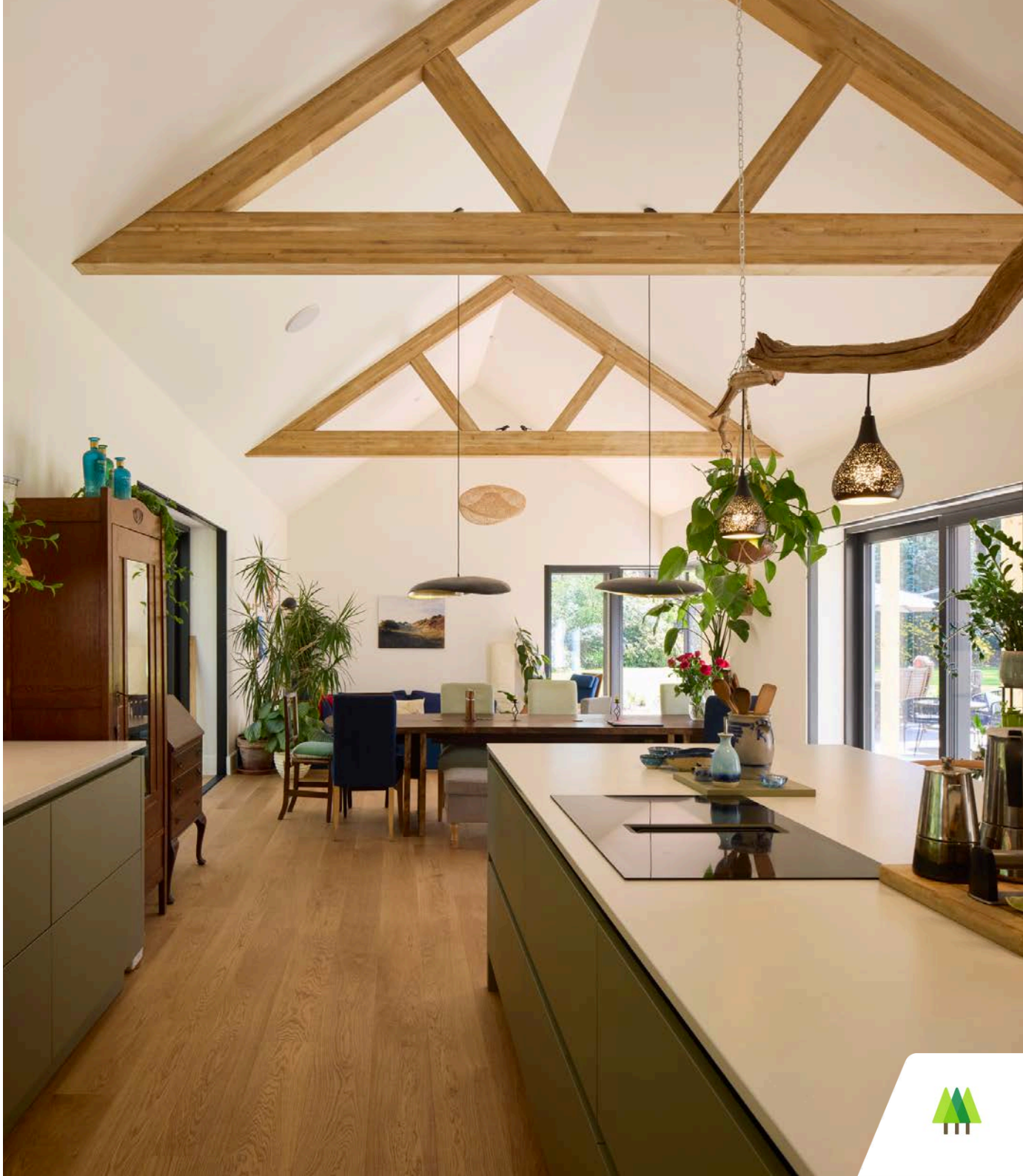
Self-Build

Materials

Larsen Truss Timber Frame

Specification

Passivhaus





The Project

Little Barn demonstrates how early collaboration between architect, engineer and specialist timber frame manufacturer can deliver an exceptional low-energy home without compromising design quality. Working alongside Footprint Architects, Lowfield Timber Frames engineered, manufactured and erected the structural timber frame that formed the foundation of the project's Passivhaus-informed, fabric-first strategy.

Located in Woodgreen, Fordingbridge, within the New Forest National Park, the project replaces an outdated dwelling that could not realistically be upgraded to modern energy standards. Instead, a highly efficient timber-framed home, pool house and sauna were created using a combination of passive design principles, high-performance building fabric and carefully selected low-carbon materials.

From the outset, the timber frame was designed to deliver exceptional airtightness, minimise thermal bridging and provide deep insulated wall build-ups that support very low heating demand. The lightweight engineered timber structure also significantly reduced embodied carbon compared with traditional construction while locking atmospheric carbon into the building for the long term.

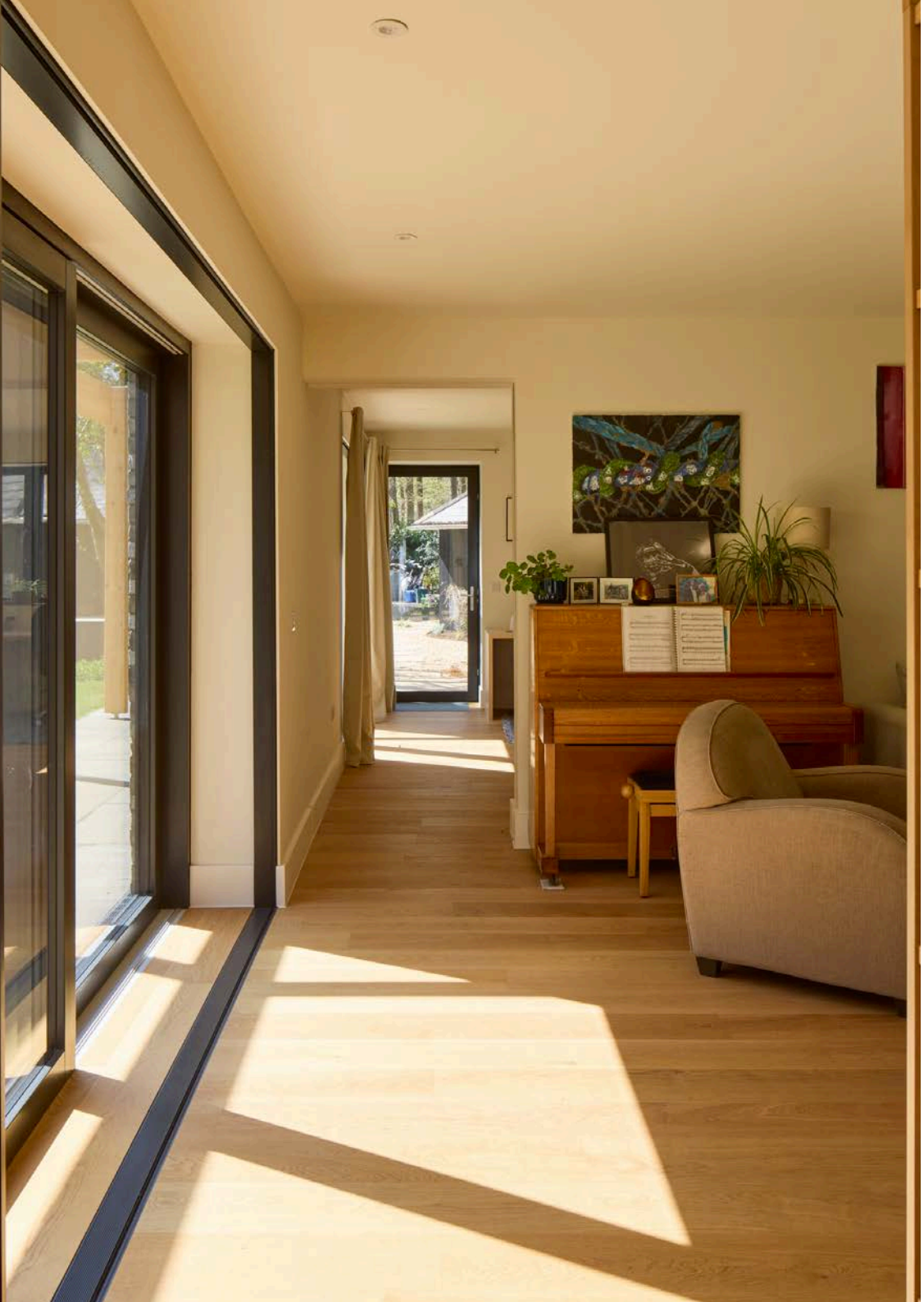
Little Barn exemplifies Lowfield Timber Frames' commitment to delivering sustainable construction through precision-engineered timber systems that combine outstanding performance, efficient off-site manufacture and long-term environmental responsibility.

The Details

- 89mm panel + 89mm panel joined to form Larsen Truss panel overall depth 400mm
- Warmcel Insulation between leaves
- 12.5mm Medite Smartply Propassiv sheathing including taping joints with Tescon Vana

The Results

- Energy Rating A / SAP 105A
- Primary Energy Use: -11 kWh/m²/year
- Fabric Energy Efficiency: 51.3 kWh/m²
- Operational emissions of -3.83 $kgCO_2/m^2$
- Air permeability: 0.65 $m^3/(h \cdot m^2)$ @ 50Pa



Scope of Services

At Little Barn, timber technology was fundamental to reducing both embodied and operational carbon. By replacing conventional masonry with a precision-engineered timber frame, the primary structure became a long-term carbon store while significantly lowering embodied emissions associated with construction.

Our off-site manufacturing process reduced material waste, improved quality control and minimised site deliveries and programme time. The engineered frame provided the accuracy required to achieve excellent airtightness and minimise thermal bridging, supporting the project's Passivhaus-informed, fabric-first design.

The result is a building that stores carbon within its timber structure, uses significantly less energy throughout its lifetime and demonstrates how engineered timber systems can deliver measurable environmental benefits from manufacture through to occupation.

“ The primary structure became a long-term carbon store while significantly lowering embodied emissions.”

Outcome

Performance targets were established from the earliest design stages using Passivhaus principles to guide the building form, orientation, insulation strategy, airtightness and thermal performance. Lowfield's engineered timber frame enabled these targets to be delivered through a highly insulated, low thermal bridge building envelope.

The completed home achieved measurable outcomes including an EPC rating of A (SAP 105A), primary energy use of -11 kWh/m²/year, Fabric Energy Efficiency of 51.3 kWh/m² and operational emissions of -3.83 $kgCO_2/m^2$. These verified figures demonstrate that the fabric-first approach substantially reduced operational energy demand.

Renewable technologies complement the performance of the building fabric, including photovoltaic panels and an air source heat pump, allowing the home to operate with extremely low net energy demand.

Rather than relying solely on bolt-on technologies, the project prioritised reducing energy demand through the timber structure itself before renewable generation was added.

This combination of measured operational performance, low embodied carbon materials and renewable energy provides clear evidence that the project has achieved genuinely low-energy outcomes rather than simply offsetting inefficient construction.



Read more about the project

https://footprintarchitects.co.uk/projects/little-barn-sustainable-family-home/

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