The SIP Build UK Knowledge Hub

WHY SIPS OUTPERFORM STEEL MODULAR IN EDUCATION PROJECTS

A Guide to Creating High-Performance, Sustainable Learning Environments

Thermal & Sustainability Benefits for Schools

When it comes to delivering high-performance, future-ready learning environments, Structural Insulated Panels (SIPs) give education projects a clear advantage over steel frame modular systems. From fabric efficiency to whole-life carbon, SIPs provide a robust, low-energy, and sustainable envelope—exactly what the Department for Education's Output Specification demands.

Fabric-First Thermal Excellence

SIPs are precision-engineered panels with a rigid insulation core bonded between two structural OSB skins. This simple, integrated construction delivers:

- Low U-values – Consistently achieving 0.10–0.18 W/m²·K without complex add-ons.
- Minimal thermal bridging – Unlike steel, which is highly conductive and requires costly thermal breaks, SIPs maintain insulation continuity across the whole envelope.
- Exceptional airtightness – Large-format factory panels mean fewer joints and an inherent air barrier, reducing heat loss and cutting energy bills.
- Comfort built-in – Warm surface temperatures and reduced cold spots support compliance with BB101 thermal comfort criteria.

Sustainable by Design

In education, sustainability is more than a target—it's an obligation.

SIPs deliver:

- Lower embodied carbon – Timber-based OSB skins store carbon, while SIPs use a fraction of the high-carbon materials found in steel frames.
- Lower operational energy – High insulation values and airtightness reduce heating demand year-on-year.
- Efficient offsite manufacturing – CNC precision, minimal waste, and lighter loads mean reduced site impact and transport emissions.

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Education-Ready Advantages

With SIPs, **schools gain:**

- A simple route to Part L compliance.
- Reliable, predictable thermal and airtightness performance.
- A quieter, more comfortable environment that supports learning outcomes.
- Long-term energy savings, helping budgets stretch further.

SIP Build UK has decades of experience delivering award-winning school buildings across the UK. Our SIP systems give you a proven route to sustainable, thermally efficient, and future-ready education spaces—without the compromises of steel modular construction.

SIP Build UK – Building Better Schools.

SIPs vs Steel Modular – Education Project Performance Comparison		
Category	**SIPs (Structural Insulated Panels)**	**Steel Frame Modular**
Typical Wall U-value (as-built)	0.10–0.18 W/m²·K achievable with single build-up	0.20–0.28 W/m²·K typical without continuous external insulation; requires thermal breaks to improve
Thermal Bridging (ψ-values)	Very low – minimal repeating bridges due to integrated insulation/structure	High risk – steel conductivity creates repeating bridges unless mitigated with costly detailing
Airtightness	≤ 3 m³/hr/m² at 50 Pa routinely achieved; fewer junctions and penetrations	5–7 m³/hr/m² typical unless extensive sealing at module junctions is undertaken
Cold Spot Risk	Minimal – warm surface temps, stable internal environment	Elevated without thermal breaks; may affect comfort and condensation risk
Embodied Carbon (Primary Structure)	Low – timber OSB skins store carbon; foam core is small proportion of mass	High – primary steel production has high CO_2e footprint
Operational Energy Impact	Low heating demand due to continuous insulation + airtightness	Higher heating demand unless over-specified insulation + airtightness measures
Offsite Efficiency	Precision CNC cutting, minimal waste, lighter transport loads	Modular efficiencies possible but heavier loads and more complex site cranage
Whole-Life Carbon (WLC)	Strong WLC performance through reduced operational + embodied carbon	Higher baseline WLC due to material and operational energy factors