

CASE STUDY

- STYLISH DESIGN
- PRECISION ENGINEERING
- EXPERT INSTALLATION



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**01756 799498**

# Sustainability Starts with SIPS

Award-winning off-grid  
home, Northumberland





**“SIPs was  
the perfect  
construction  
solution.”**

**PETER MOUNCEY**

**Peter and Diana dreamt of living  
an off-grid life, so turned to SIPs to  
build their net carbon zero home in  
Northumberland.**

### **OFF-GRID AMBITIONS**

Westfield is a structural insulated panel (SIPs) self build home, designed and built by an aspirational couple who wanted to build an exemplar for sustainable development in rural Northumberland.

Their objective was to create a home that would minimise their environmental impact by using renewable and recyclable materials, rely solely on wind and solar energy and achieve net zero carbon or better.

Alongside being a beautiful, sustainable home for Peter and Diana, the couple intend to make this inspirational project into a study centre for others to learn from by making the energy in use data accessible. This pioneering project will help to inform other aspiring self builders and shape the future of sustainable homes in Northumberland.

### **PROJECT DETAILS**

Homeowners:	<b>Peter Mouncey &amp; Diana Taylor</b>
Project:	<b>Off-grid SIPs Self Build Home</b>
Location:	<b>Northumberland</b>
Size:	<b>300m<sup>2</sup></b>
Cost:	<b>£427,000</b>
Completion:	<b>May 2023</b>

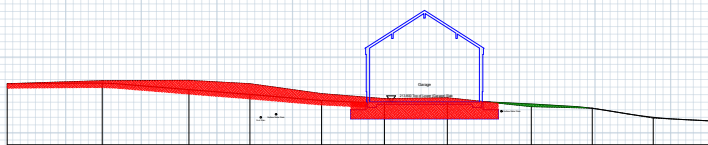
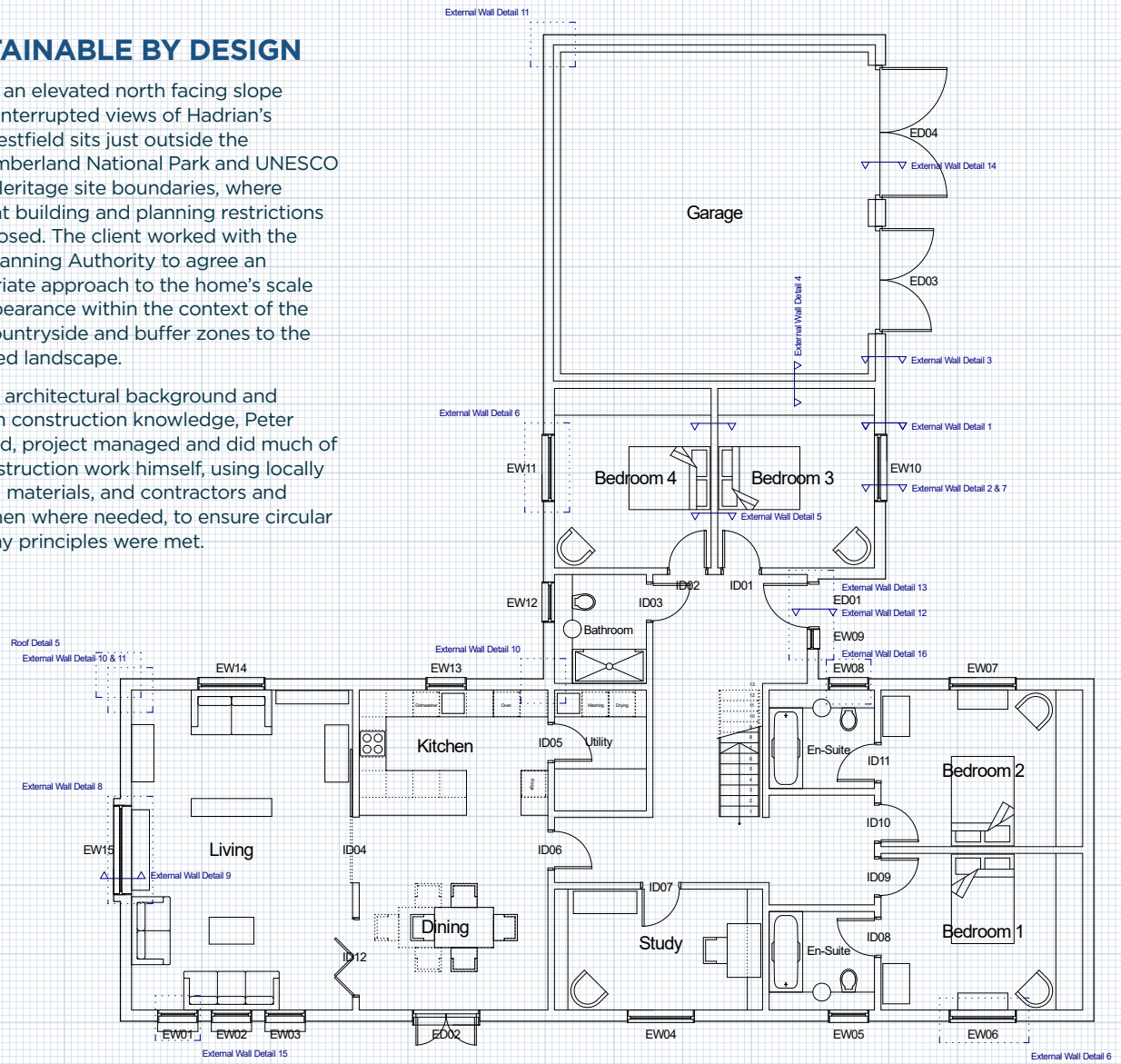




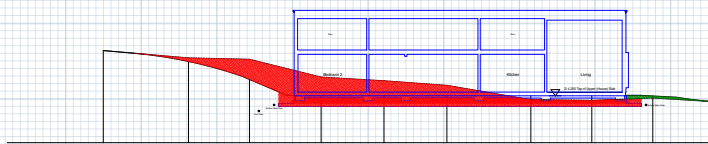
## SUSTAINABLE BY DESIGN

Built on an elevated north facing slope with uninterrupted views of Hadrian's Wall, Westfield sits just outside the Northumberland National Park and UNESCO World Heritage site boundaries, where stringent building and planning restrictions are imposed. The client worked with the Local Planning Authority to agree an appropriate approach to the home's scale and appearance within the context of the open countryside and buffer zones to the protected landscape.

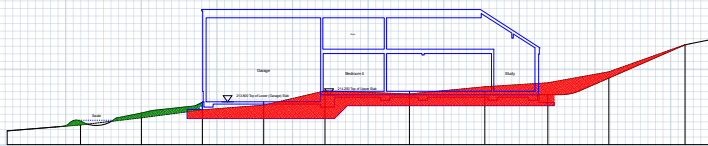
With an architectural background and in-depth construction knowledge, Peter designed, project managed and did much of the construction work himself, using locally sourced materials, and contractors and tradesmen where needed, to ensure circular economy principles were met.



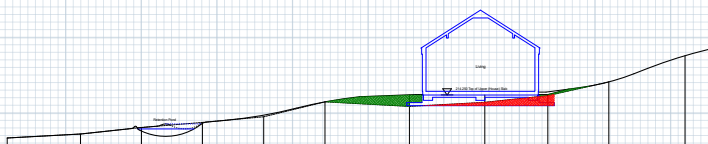
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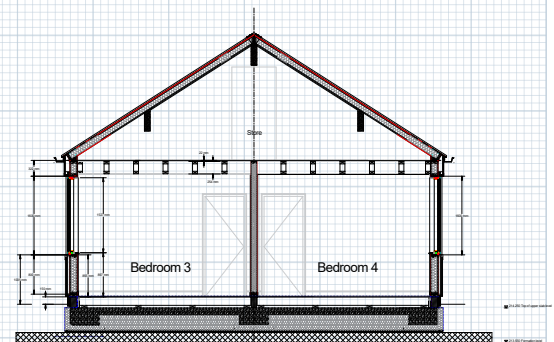
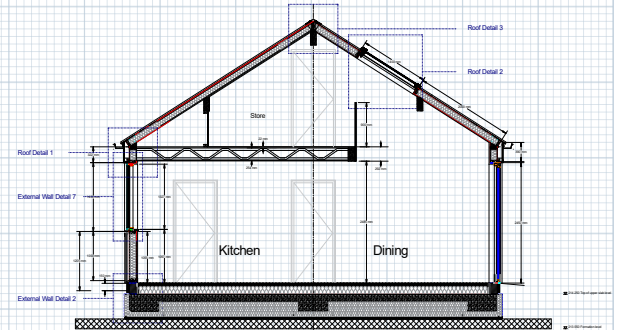
E-W Section 5



N-S Section 15



N-S Section 17





## GREEN TECHNOLOGY

Combining key Passivhaus principles, Peter's contemporary interpretation of the local vernacular and inspiration from sustainable projects he had previously worked on, Westfield was designed to be a 1.5 storey, four bed bungalow with 300m<sup>2</sup> of internal living floorspace plus a 50m<sup>2</sup> garage utilising sustainable SIPs construction.

It has a 32.5° pitch VMZINC Zinc standing seam roof, vertical Siberian Larch cladding to the walls and VMZINC cladding panels below the windows, which were all specified for their sustainable credentials.

Complemented by triple glazing and onsite renewable energy sources including mechanical ventilation heat recovery system (MVHR), 6.4kw of solar panels, a 3kw wind turbine with a lithium battery to smooth out the differences of supply and demand for power, plus a freestanding 3kw bioethanol stove, which burns sugar beet waste, every element of Westfield has been carefully and tastefully curated to achieve the clients' net zero ambition.

With double height living spaces, mezzanine levels and a room in the roof, the unparalleled compatibility of SIPs with sustainable specifications, without the need to compromise on design, really shines through.

By utilising smart monitoring technology, the clients measure and attain their low energy targets, compiling the information to share with people with similar net zero ambitions. Recent data showed that in one day they avoided 14kg of CO<sub>2</sub>, the equivalent of planting one tree.

Peter and Diana's environmental ambitions extend to the land around Westfield, where they have created a wildflower meadow and wetland area to improve biodiversity, as well as new tree and hedge planting to improve connectivity to wildlife. They have also installed an electric vehicle charging point.





# Why SIPs?

## DESIGNED TAKING A FABRIC FIRST APPROACH

142mm Kingspan TEK SIPs were specified from the outset, not only for their thermal efficiency and low carbon footprint but also as a low impact construction method.

With exceptional airtightness, low U-values and minimal thermal bridging, SIPs outperforms other construction methods in virtually all environmental categories and Peter knew SIPs met the brief perfectly.

In fact, the couple's off grid home achieved an overall EPC rating of A+ and a very impressive airtightness test score of 0.6m3/hour/m2 at 50Pa. This result was so low, that the SAP assessor had to take the readings twice to validate them!

As well as the outstanding sustainability and superior energy efficiency of SIPs, the system's low impact construction qualities and in particular the offsite manufacturing, aligned perfectly with Peter and Diana's carbon zero ambitions and the challenges of Westfield's noted location.

SIPs are precision engineered in a controlled factory manufacturing process that produces minimal product waste. The system requires fewer site deliveries, less construction machinery and fewer trades-people than traditional building methods and as a result has minimum impact on the local surroundings – essential when you're building on the boundary of a UNESCO World Heritage site with challenging site access.

With the plot only accessible via one single track road and with a difficult 90° turn going uphill, the articulated lorries needed to deliver the structural insulated panels were offloaded at the bottom of the track and transported to site by flat trailer and pickup truck. This would not have been possible with traditional methods of construction and demonstrates the flexibility and simplicity of SIPs.

Speed of build was also a key factor in the project and using SIPs gave Peter & Diana a predictable build programme. SIPs@Clays' skilled installation team quickly erected Westfield's SIPs superstructure, taking just ten days until the home was water-tight and ready for ongoing construction.

**“Not only did SIPs seem to be the best way to achieve the degree of air tightness that we wanted but the speed of erection reduced the risk of our timeline being disrupted by the Autumn weather.”**

PETER MOUNCEY





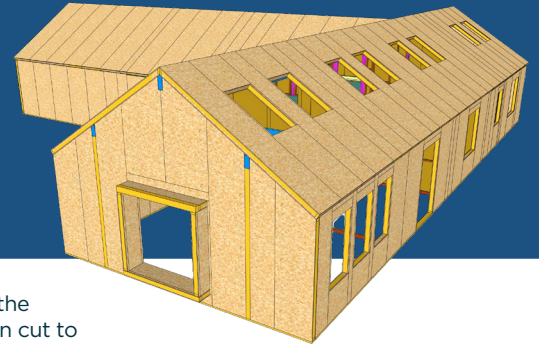


**“One of the most significant milestones of the build was the completion of the SIPs enclosure, which gave us our first real reassurance that the internal spaces and relationship to the landscape were consistent with our vision.”**

**PETER MOUNCEY**

## Our work

Working closely with Peter and Diana to ensure that the SIPs superstructure met their sustainable construction ambitions, SIPs@Clays set about SIPs designing and precision engineering the system from their studio and factory in Skipton, North Yorkshire.



Providing value engineering as standard, the SIPs@Clays design team optimized the functionality and costs throughout the project to ensure that it achieved not only value for money but also offered sensible solutions that further enhanced the outcome of this ambitious project.

Once the designs were signed-off, the Kingspan TEK panels were precision cut to size and transported to site where, despite the challenges of the rural location, it took the SIPs@Clays team just two weeks to erect Westfield's superstructure, making it weather tight and ready for next trades.



**“SIPs@Clays were proactive and professional at each stage of the design, manufacturing and construction of the SIPs enclosure. They listened to what we wanted and found solutions rather than problems. The site team were friendly, reassuring, adaptable and diligently supported by the office, manufacturing, procurement and delivery teams.”**

**PETER MOUNCEY**





## SAP RESULTS

EPC Rating: **A+**

Airtight Test: **0.6m<sup>3</sup>/hour/m<sup>2</sup> @ 50Pa**



## Award Winner

As an exemplar for sustainable construction, Westfield was crowned **Best Eco Home** in the Build It Magazine Awards 2024. The project was also short-listed for **Best SIPs Home** in the same awards and named as finalists for **Low Energy Project of the Year** and **Custom & Self Build Project of the Year**, in the Structural Timber Awards 2024, accolades that both Peter, Diana and SIPs@Clays are very proud of.

Westfield clearly demonstrates what can be achieved with vision and passion and is testament to building with SIPs. When asked if there was anything he would have done differently, Peter replied...

**“Yes, I wish that I had done it earlier!”**



(L-R) Ian Clay SIPs@Clays with self builders Diana Taylor & Peter Mouncey.

For more information on building your own sustainable SIPs home, contact the **SIPs@Clays** team.



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