

The Osborne Demonstration House
at the BRE Innovation Park



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Pushing the Boundaries of Sustainable Housing



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Key Facts

- Jabhouse construction using Structural Insulated Panel System (SIPS) with roof and floor Cassettes.
- Requires one third of the energy for heating and cooling of a house constructed to 2006 Building Regulation standard.
- Is airtight to one tenth of the new Building Regulation requirement, with a whole house heat recovery/ventilation system.
- Achieves a 40% improvement on target Building Regulation carbon emissions.
- Received an EcoHomes 'Excellent' rating.
- Structure erected in 1.5 days.
- Achieves improved acoustic performance.
- Includes Smart technology throughout.

The Osborne Demonstration House at the BRE Innovation Park in Watford was completed in July 2006. The house has been constructed as a showcase for our 'Jabhouse' SIPS product. It shows that this innovative method of construction, which has been enhanced by other modern building components, demonstrates exceptional sustainability and increased environmental performance.

Our Key Partners



Week 1 – March 2006 ▶▶



Week 2 – April 2006 ▶▶





The Jabhouse Story

Not just a demonstration project...

Jabhouse is already being used by Osborne's RSL clients for new affordable housing, for example...



The original pilot project – Blacksmiths Crescent, Sompting
Three houses for Southern Housing Group.

James Road, Gosport
18 homes as part of an estate regeneration for Portsmouth HA.

Wyphurst Road, Cranleigh
15 houses at Downland HA's rural development.

Jabhouse is Born

Osborne first started working with insulation products manufacturer Vencel Resil in the 1990s, and quickly recognised the advantages of using factory-produced components such as roof cassettes for the affordable housing newbuild market.

Osborne's research and development team were also introducing other new forms of construction for RSL developments; they recognised the potential of Vencel Resil's SIPS product for providing an effective Modern Method of Construction and the joint venture that became Jabhouse was born.

Using SIPS, with the panels' impressive environmental performance, meant housing could be put up more quickly, provide better soundproofing and be more energy efficient.

The resulting 'Whole House System' became known as 'Jabhouse'. Osborne believed so passionately in the future of Jabhouse that in 2005 it created a wholly-owned subsidiary, Innovare Systems, and set up an exclusive supply chain agreement with Vencel Resil for the supply of their Structural Insulated Panels in the UK.

Our first pilot project with Jabhouse was for Southern Housing Group, a terrace of three units erected side by side with a terrace of four in timber frame to compare construction and use. SHG presented Osborne with an award for design innovation, reduced number of defects and high resident satisfaction especially with the 'excellent thermal insulation' (one resident's gas bill for nine months was £60). The merits of our Jabhouse were real and there for all to see on site.

Jabhouse Evolves

During 2005 discussions took place with the BRE, who were interested in how the system could be further adapted to create improved thermal ratings.

A fourth plot at the BRE innovation Park was allocated for the experiment and the idea for the Osborne Demonstration House was created.

The new house was to be the ultimate exercise in Industry Best Practice, applying some of the most modern and exciting construction techniques ever used on a housing site in the UK. We were to push the Jabhouse concept to achieve excellent environmental performance, whilst still striving for an affordable solution that could be utilised on many different social housing projects.

The Story Today

The Osborne Demonstration House started on site in March 2006, with the support of our extensive supply chain. Our suppliers were enthusiastic in helping us to create our vision and were encouraged to contribute innovative products and systems they were developing and using.

The Demonstration House comprises a conventional ground floor layout with a working kitchen, living room and WC. An exhibition space has been created on the first floor and the second floor demonstrates how an extra 'room in the roof' can be accommodated by the use of roof cassettes.

The house has generated much press and industry interest, and meets many aspects of the government's sustainability and affordability agendas for housing.



Features and Benefits

- Innovative solution to meet the demands of the house building industry. Improvements in quality using Offsite Manufacture – not just in the main structure but also in a range of other components.
- Demonstrates that SIPS technology offers excellent performance in:
 - Design flexibility
 - Energy efficiency
 - Ease of handling on site
- Other materials used on the house have been chosen to enhance the environmental credentials offered by the Jabhouse system.
- Real Supply Chain Partnering in action.
- One solution to the skills shortages in the industry.
- Offers an affordable solution, both in terms of cost to the client and to the resident.
- Addresses fuel poverty.
- Reduces environmental impact and carbon emissions.
- Reduces global resource depletion.

Sustainable Design

- Contemporary yet simple and economic design.
- Maximises flexibility, adaptability, thermal and energy efficiency, demonstrating the wide range of design options offered by Jabhouse.
- Meets Housing Corporation Scheme Development Standards.
- EcoHomes 'Excellent' rating.
- Designed to Lifetime Homes standard.

Jabhouse Benefits to the Client and Contractor

- Speed of construction – envelope completed in one-and-a-half days.
- Integrated, engineered system.
- Flexibility in design and build – adaptable to a wide range of architectural designs.
- Flexibility of internal layout – allows for the modification of internal configurations, including 'room in the roof' space.
- Virtually zero waste on site by using OSM and optimising material usage.
- Affordable – at a capital cost which is comparable to traditional methods of construction.
- Full system approval from the BBA.

Jabhouse Benefits to the Resident

- Drier, warmer home for lower heating costs.
- Reduced noise levels from neighbouring properties.
- Healthy living environment with passive ventilation.
- Environmentally friendly.
- Solid, robust construction.
- Buildings insurance accepted by NHBC, Zurich, Building Lifepans and others.



Week 2 – April 2006 ▶▶



Week 3 – April 2006 ▶▶



Week 4 – April 2006 ▶▶

Technical Details and Performance Statistics

Thanks to the BRE and The Energy Saving Trust for independently assessing this project.

- The Osborne Demonstration House requires around one third the energy for space heating and cooling compared with the same house built to 2006 Building Regulations standard.



- Cold bridging: Consider each element of structure to minimise cold bridging. SIPS construction minimising structural timbers.
- Efficient heating systems: Efficient condensing gas boiler for backup heating. Low energy lighting throughout.
- Lower than Building Regulations target carbon emission rate:



Giving 40% improvement on 2006 Building Regulations.

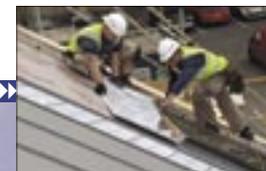
- Renewable sources of energy: Solar water heating.
- Sustainable materials: All timber used either FSC or PEFC certified. Use of recycled materials. Recyclable materials. Minimising waste.

Energy Efficiency

The energy strategy is to reduce demand, maximise renewable energy and use fossil fuel as efficiently as possible. We have also considered the whole house and taken a holistic approach looking at each element – thermal insulation, ventilation, cold bridging and heating systems.

- Thermal insulation:

| | | | |
|-------|------------|---------|------------|
| Walls | 0.14 W/m²K | Floor | 0.16 W/m²K |
| Roof | 0.10 W/m²K | Windows | 0.8 W/m²K |
- Controlled ventilation: Target of 1 m³/m²/hr air leakage. One-tenth the Building Regulation minimum standard. Minimising heat loss. 90-96% efficient whole house heat exchanging ventilation system.



Week 5 – April 2006

Week 6 – May 2006

Week 7 – May 2006

House Specification

Substructure/Ground Floor:

Pre-cast ground 'T' beams on short piles
Insulated flooring system

Main Structure:

Jabhouse utilising:
Structural Insulated Panel System
Prefabricated floor cassettes with I-beams
SIPS roof cassettes
Highly insulated windows and external doors
Airtight seals

External Finishes:

Siberian larch cladding
Recycled plastic slates
Zinc
Render
Eternit boarding
Fireborn brickwork

Internal Components:

Prefabricated bathroom pod
Prefabricated internal door sets
Megadeco board
Kitchen
Kitchen appliances

Internal Services:

Solar hot water heating
Heat recovery ventilation system
Under floor heating
Skirting board heating
Condensing boiler
Pluggable wiring system
Wireless switching
Whole house entertainment/data system
Security
EIB System

External:

Permeable paving
– Marshalls Mistral Piora
Promotion of wildlife

Water Saving Innovations:

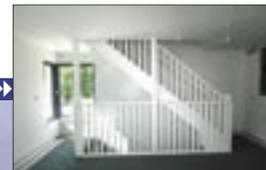
Rainwater disposal system
Low usage sanitary ware
Low usage and temperature control taps

Other adaptations:

Disabled through-floor lift
Provision for extra door and hoist adaptations in bathroom



Week 12 – June 2006 ▶▶



Week 13 – June 2006 ▶▶



Osborne Demonstration House Supply Chain



Bullivant: foundations, ground floor – installation, ground floor – pre-cast concrete products, ground floor – insulation system

Melton Concrete: ground floor – pre-cast concrete products

Collecta: ground floor – insulation system

Velta: underfloor heating

W T Burdens: drainage – products

Vencel Resil: SIPS structure (including roof cassettes), SIPS supplied to Innovare Systems, porch unit

Innovare Systems: supply Jabhouse complete structure – walls, internal partitions, roof and floor cassettes

Illbruck Sealant Systems UK: seals – airtight

Eleco Timber Frame: internal partitions

FinnForest UK: floor cassettes – components

Covers Timber Products: floor cassettes – manufacture and delivery

Stramit Industries: floor cassettes – section covering

Umicore Marketing Services UK: roof coverings – zinc, cladding – zinc, RVVGs – zinc

All Metal Roofing: roof coverings – zinc, cladding – zinc, RVVGs – zinc

Marley Eternit: roof coverings – eternity slates, cladding – rainscreen – Eternit

W T Eden: sheet material

Swedish Timber Products: windows – S&F

Fakro: rooflight

Worcester Bosch: solar panels, boiler

Offsite Solutions: 1st floor bathroom pod

Simpson Strong Tie: metalwork/hangers/ties

lbstock: cladding – brickwork

CPI: cladding – mortar

BRC: cladding – brick sundries

Acorn Insulation: cladding – brick sundries

Smart Home Solutions – facilitated by CEDIA

The intelligent systems equipment in the house was provided and installed by:

Digital Plumbers: network router and hub and entertainment equipment

Armour: ceiling speakers and remote controls

Pioneer via AWE: plasma screen

Kef Audio UK: surround sound system

Computers Unlimited: digital multi-room audio

BT Redcare: alarm transmission system

Berker in co-operation with International Lighting Solutions Ltd (UK Distributor): Konnex/EIB controls

Datwyler (UK) Ltd: Konnex/EIB cable

Alumasc: cladding – render

Travis Perkins: cladding – timber, shutters

EBC: cladding – rubber tiles

Metalline Architectural Fabrications: aluminium feature channel

Rainhandler Europe: RVVGs – gutters – rainhandler unit

M K Electrical: electrical and data (communications), electrical fittings

Heat Profile: radiators – skirting/coving

Russell Doors: doors and frames – externally – S/O

Premdor Speed Sets: doors and frames – internally – S/O

Wessex Medicare: lift – between ground and first floors

Greenwood Airvac: venting/ventilation heat recovery

Cavity Access Systems: cut out/access points

Twyford: sanitary ware

Mira: sanitary ware

Deva: sanitary ware

Ancon: insulation – supply

Lefarge: drylining – installer, drylining – materials

Symphony: kitchen units

BSH: kitchen – appliances

Jackson Fencing: fencing and decking

Marshalls: paving and pavious

Häfele (HAWA): shutters

Regal Carpentry Contractors: frame erection, other carpentry

Residential Approved Inspectors Ltd: building regulations approval

Trenton Fire Ltd: fire strategy



BRE – Building a Better World

The Osborne Demonstration House is the fourth house to join the BRE Innovation Park, which was launched in 2005 to demonstrate how innovative building systems and technologies can deliver higher levels of performance compared with conventional forms of construction.

By trialling and demonstrating new and emerging construction methods and technologies for buildings such as renewables, environmental systems, smart IT systems and sensor technologies, the Innovation Park represent a major new service for the UK construction sector. Alongside the Osborne Demonstration House there are three other housing examples on the park in timber, concrete and steel with a further programme of buildings currently being planned for the site.

The BRE welcomed the opportunity to accommodate the Osborne Demonstration House on the Innovation Park because it very much fits in with our aim – to build a better world. The house is highly innovative, has very impressive sustainability credentials and a striking design. Given the current housing shortage in the UK, the need to cut carbon emissions and the need to provide affordable housing, the Osborne Demonstration House is an outstanding example of how this can be achieved.

Peter Bonfield
Director of Construction Division, BRE

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OSBORNE

Founded in 1966, Osborne is a respected provider of complete construction solutions, with specialist divisions covering Building, Civil Engineering and Rail, Social Housing, Maintenance and Stonemasonry. After 40 years it remains privately owned, has a turnover of over £225 million and employs some 900 staff and operatives in Chichester, Reigate, London, Redhill, Newport Pagnell, High Wycombe, Basingstoke, the Isle of Wight, on numerous sites across the southern half of England and in shared client offices.

For further information, please contact:

Osborne
Wray Coppice
Oaks Road
Reigate
Surrey RH2 0LE
Tel: 01737 223366
Email: enquiries@osborne.co.uk
www.osborne.co.uk

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