

MATERIAL
CONSIDERATIONS
A NATURAL FACTORY

24

CASE STUDY
THE PASSIVE HOUSE







With thanks to Ewen Weatherspoon for photography.

Timber technologies

The Passive House units utilise a locally manufactured PassiveWall™ timber frame closed panel system, ensuring a high standard of construction quality and accuracy, while providing extremely low U-values and high levels of air tightness. The panels are made from home grown Scottish timber with an insulated core of recycled glass wool made from 80% recycled glass bottles.

The external panels are pre-wrapped with a thermal foil membrane and internally with a pre-fitted thermal vapour barrier which provides the main air tight seal and an extremely high level of air tightness.

The external units are clad in locally sourced Scottish larch timber sourced within 60 miles of the site, broken by continuous vertical reveal boards and vertical square edged boards with cover battens to the rear elevation. The cladding is left untreated to weather naturally to a silver grey colour, thus embedding the buildings within the landscape.

Locally sourced FSC timber was also specified for the cladding battens externally, for battens to form service gaps to the inside of the external walls and other sundry works such as skirtings, cills, door posts and door facings.

Special timber-related features

The terrace has achieved an 80% reduction in energy by using a locally manufactured off-site prefabricated closed panel system and high performance windows to provide a super-insulated airtight building fabric.

Ventilation heat losses are massively reduced whilst ensuring excellent thermal comfort internally.

A balanced mechanical ventilation system also reduces heating bills and provides a cleaner, fresher quality of indoor air. Hot water is provided from an air source heat pump. Biodiversity is enhanced through careful landscape design and the use of local species, enhancing of wildlife habitats, composting and providing opportunities for food production.



CASE STUDY

THE PASSIVE HOUSE

Name of building

The Passive House

Date completed

2010

Building type

Residential

Location

Scotland's Housing Expo, Milton of Leys, Inverness

Architect

HLM Architects

Client

Highland Housing Alliance/O'Brien Homes

Main contractor / timber supplier

O'Brien Homes

Russwood for external cladding

RTC for timber structure

Awards

Glasgow Institute of Architects (GIA) Awards 2010,
Design Commendation

Background to building

The overall aim of the project was to create an exemplar of three terraced houses as a catalyst for the wider building industry, and as an inspiration for future housing design and development.

The houses use the rigorous German 'PassivHaus' standard for energy efficiency, resulting in ultra low-energy houses which dispense with conventional heating systems altogether. In fact, the heating load is so small that a hairdryer could be used to heat the house.

The houses were designed to be quiet, modest, sustainable, affordable and attractive to both volume house builders and social housing providers alike.

They were erected in only nine days by site operatives who were previously unfamiliar with this type of prefabricated, modern method of construction.

Material Considerations

A Natural Factory

Forestry Commission Scotland

Silvan House
231 Corstorphine Road
Edinburgh EH12 7AT

+44 (0)845 367 3787

fcscotland@forestry.gsi.gov.uk

Sust.

Architecture + Design Scotland

The Lighthouse
11 Mitchell Lane
Glasgow G1 3NU

+44 (0)141 204 3635

info@sust.org
