

University of Aberdeen Passive House Nursery

Summary

The University's pre-school childcare was previously provided in an ageing building that struggled to cope with demand from staff and students. The solution: build a larger, purpose-built facility, reflecting best-practice in modern child-care. The scale and nature of the build provided an opportunity to stretch the institutional commitment to sustainable buildings, with the dual aim of Passivhaus and BREEAM accreditation.

Project Partners

Our Design Team was led by Boswell Mitchell Johnson (BMJ) Architects and our main contractor was Burns Construction. Key Design Team members included KJ Tait (Mechanical & Electrical and BREAM), Talbots (Quantity Surveyors), George Watt and Stewart (CDM), Cameron + Ross (Structural Engineers) and Future Komfort (specialist Passivhaus consultants). The internal Project Board also consulted widely with Nursery staff, parents, the Aberdeen University Students Association and academic colleagues in the School of Education. The Care Inspectorate was also engaged at every stage in the process.

The Problem

Our project brief: an energy efficient, sustainable building.
The architect's proposal: an innovative Passivhaus design.
The hurdle: a lack of local expertise in Passivhaus buildings.

Although none of the project partners had experience of Passivhaus construction, all were familiar with energy efficient design and all bought in to the requirement to learn 'on the job'. Our specialist Passivhaus consultants (Future Komfort) provided expertise and assessed the design and compliance of components and installation, while the site team undertook professional development courses and adopted a site mentality that emphasized the high level of attention to detail and finish required to satisfy Passivhaus accreditation.

The Approach

- A fabric first approach from the outset.
- Meticulous attention to detail in all aspects of the build.
- Specialist advice to supplement and oversee local trades.
- A collaborative, open-book approach to tackling on-site issues.
- Wider consultation with key partners e.g. Care Inspectorate, educationalists, Nursery staff etc.

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LiFE Framework:

Sustainable
Construction



UNIVERSITY
OF ABERDEEN

Institution Profile

- Founded 1495
- Research intensive
- 16,500 students

The New Rocking Horse Nursery



Our Goals

- To stretch the institutional commitment to energy efficient construction.
- To minimize energy consumption and associated costs in the building.
- To provide excellent environmental conditions for the staff and children in the Nursery.
- To increase capacity and satisfy institutional demand for pre-school childcare.
- To support the institutional commitment to family friendly policies.

Obstacles and Solutions

Obstacles	Solutions
• Adverse ground conditions (marshy sub-soil).	• Sinking of 43 piles (average of 24m deep).
• Need to ensure an air tight building envelope and to avoid heat loss.	• The identification of a named 'taping champion' on site (and the use of specialist materials inc. 5km of tape).
• No direct experience of Passivhaus construction.	• Appointment of specialist consultant and a detailed CPD programme.
• Limited (or no) local suppliers of Passivhaus quality components.	• Identification of European suppliers of windows, skylights and MVHR.
• Complexity of installation detailing e.g. to avoid cold bridging and to ensure certification compliance.	• Well managed site; buy-in from all contractors; commitment to 'quality' throughout.

Performance and Results

Although too early to gauge exactly how the building will perform, benchmark tests were all positive. The air-tightness scores (critical to Passivhaus performance) were very good and the Mechanical Ventilation and Heat Recovery (MVHR) system was installed and tested at 87% efficiency. LED lighting is used throughout while grey-water harvesting and solar hot-water systems enhance the sustainability profile.

The Passivhaus design uses solar gain, as well as radiated heat from users and equipment, and Air Source Heat Pumps linked in via the MVHR to ensure a steady building temperature, with no recourse to additional heating anticipated unless in extreme cold.

Lessons Learned

Although undoubtedly challenging, Passivhaus is viable and requires comprehensive buy-in from all parties. This requires a willingness from client, architect and contractor to adopt a mindset that varies significantly from that on other builds. The capacity to work differently, adopt new techniques, and adhere strictly to a regime that requires components endorsed for Passivhaus design underpins the methodology.

Having set out as Passivhaus novices, this 'team' approach has been rewarded with a building that is on course to become the first fully accredited Passivhaus in the sector and the first in Scotland to achieve both Passivhaus and BREEAM 'Excellent' accreditation.

Further Information

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Sustainability site:
www.abdn.ac.uk/sustainability

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EAUC Educational Member Case Study



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