Oran and Passivhaus

Oran Architecture | Passivhaus Guide

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Introduction

Welcome to Oran Architecture.

We are a dynamic and forward-thinking architecture practice based in Scotland. As a new presence in the industry, we bring fresh perspectives, creative solutions, and a commitment to shaping spaces that inspire and endure.

At Oran Architecture, we believe that great design emerges from collaboration, innovation, and a deep understanding of our clients' needs. Our approach is built on clear communication, attention to detail, and a passion for delivering exceptional results on time and within budget.

Supporting this approach is our commitment to sustainable design and Passivhaus expertise. By integrating the rigorous principles of Passivhaus into our design process, we can help clients and collaborators make informed, meaningful decisions to ensure successful outcomes.

This document provides a comprehensive overview of what we can offer in terms of Passivhaus design capabilities and the value it can bring to your project.

We look forward to working with you in creating architecture that performs exceptionally — **for people, place, and planet.**

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What is Passivhaus?

The What

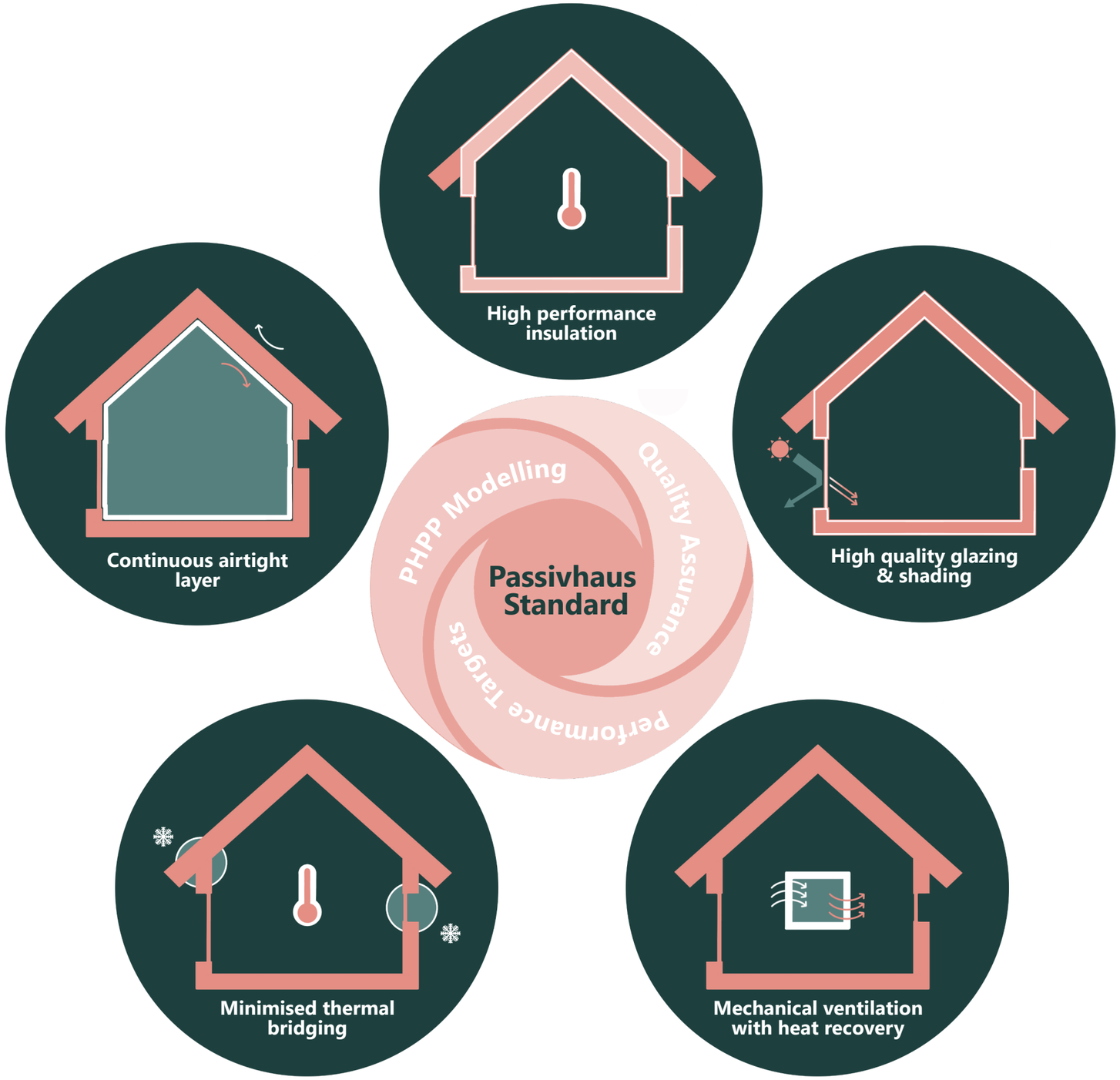
Passivhaus Principles

Passivhaus is a **performance-based building standard**, a tried and tested solution to reliably deliver **low energy buildings,** whilst providing a **high level of occupant comfort**, and **high-quality construction**, verified through a **stringent quality assurance process**.

3 core strategies form the holistic approach of the Passivhaus standard -

- **Clear performance and comfort targets**
- **Design optimisation utilising the Passivhaus Planning Package (PHPP)**
- **Quality assurance through impartial certification**

Together with the 5 building principles of Passivhaus design, **project-specific solutions** are achieved in each Passivhaus building to provide **energy efficiency, comfort and quality**, not only as designed but also **as built.**



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Passivhaus as a Design Tool

The How

PHPP: A Design Tool

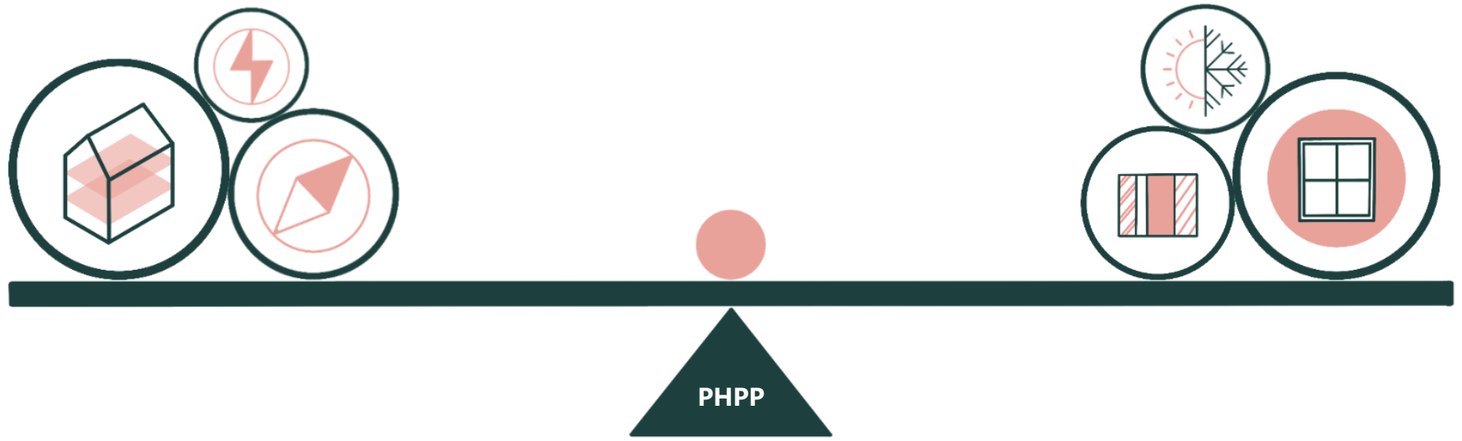
All Passivhaus buildings are modelled and optimised using the **Passivhaus Planning Package (PHPP)**.

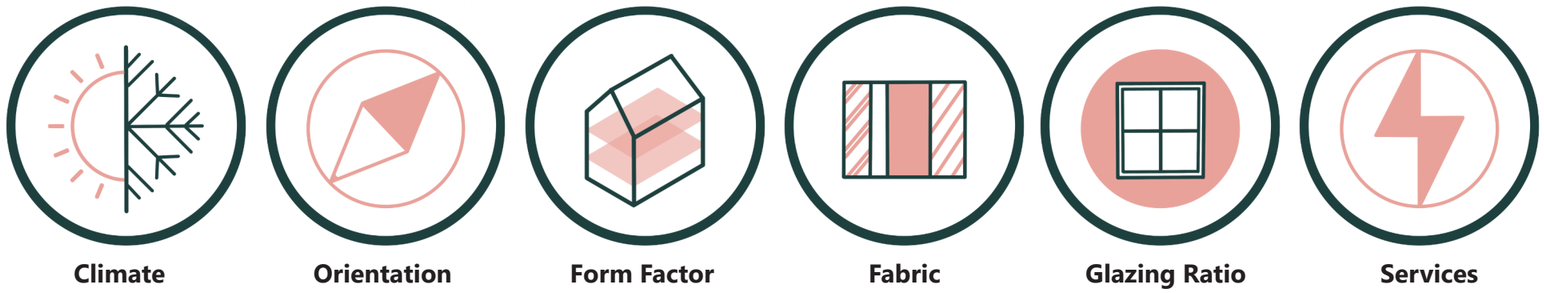
The PHPP is an **energy modelling tool** that provides an **accurate, project-specific energy balance**, taking into consideration all aspects of a building like **climate, orientation, form factor, fabric, glazing ratio and services**.

Using the PHPP from the early design stage as a **design tool** helps **identify the most impactful details and opportunities for optimisation**.

Passivhaus focuses on **overall energy balance** and **meeting performance criteria**, rather than dictating individual building elements. This gives **freedom to optimise design**. For example, achieving a good form factor will contribute significantly to the energy balance thus allowing for relaxed performance in insulation, vice versa.

This flexibility supports **true value engineering**, balancing energy efficiency, cost, and quality for the best project outcomes.





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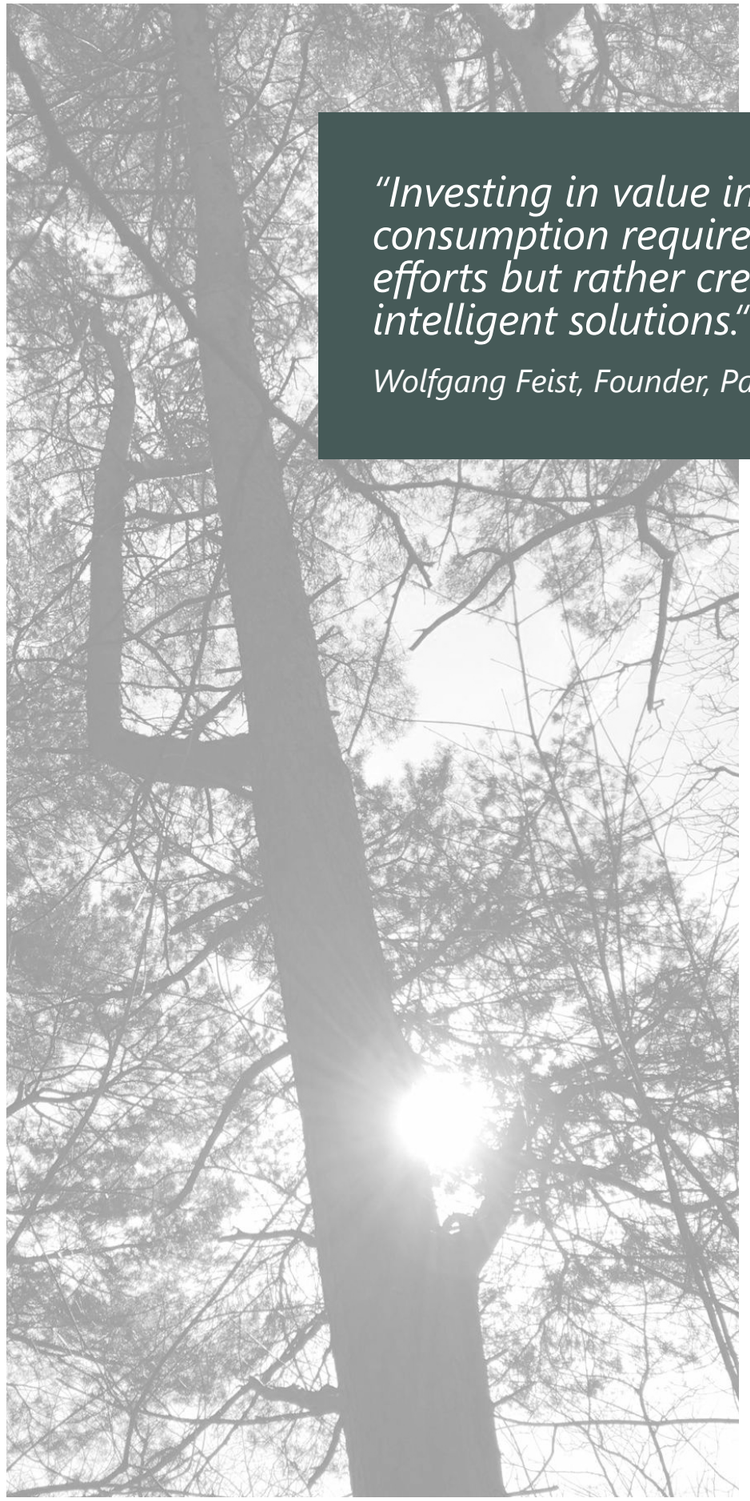
Benefits of Passivhaus

The Why



Benefits of Passivhaus

"Investing in value instead of energy consumption requires little financial efforts but rather creativity and intelligent solutions."

Wolfgang Feist, Founder, Passivhaus Institut

The fear of extra costs is often a stumbling block to implementing the Passivhaus standard - we aim to show that Passivhaus costs is actually about getting more value in return

Adopting the Passivhaus standard has wide-ranging benefits:

Ultra-low Energy Use - dramatically reduced running costs and carbon emissions.

Outstanding Comfort - stable indoor temperatures, no draughts or cold spots during winter, with reduced risk of overheating during summer.

Healthy Living - continuous supply of filtered fresh air with low CO_2 levels, controlled humidity levels and reduced external air pollutants.

Minimised Performance Gap - actual energy use is closely aligned with PHPP modelling projections, no surprises with predicted running costs.

Proven Durability - robust construction avoids defects like mould, and remain unaffected by long-term climate changes and temperature extremes

Net Zero Ready - ultra-low energy use makes Passivhaus buildings readily suited for renewable energy sources and decarbonisation.

Occupant Performance - particularly important in workplace and learning environments, increased comfort and well-being leads to increased morale and productivity, better learning outcomes and less absentees.

Social Value - better living environments ease pressure on health and social services, and reduces fuel poverty

It is clear that a Passivhaus building provides many comfort, health and well-being to its occupants, not to mention financial benefits like low running costs.

What about the financial value that Passivhaus buildings can provide for building owners or developers? Here are examples of how Passivhaus can be facilitate financial returns:

Higher Capital Value (5-7%[1]) - Passivhaus buildings command stronger valuations due to proven performance.

Lower Risk of Defects Litigation - robust construction and rigorous quality assurance reduces liability exposure.

Future-proof Asset - more stringent than current building standards, holds value against future carbon or efficiency legislation, reducing stranded asset risk.

Access to Cheaper Green Finance – meeting ESG and sustainability criteria enables access to a wider range of funding sources

Lower Management Costs – fewer complaints, fewer call-outs, and more predictable operations and maintenance costs.

Lower Whole Life Costs – savings across construction, operation, and maintenance phases.

Stable Rental Market Performance - enhanced comfort, health, and affordability attract and retain tenants, and lower energy bills strengthen affordability and payment reliability from tenants.

While early UK Passivhaus projects showed an average 8% uplift compared with standard construction (falling to 4% at scale[2]), this is reflected in the higher capital value that the Passivhaus buildings hold, not to mention all of the other non-monetary benefits. Therefore **choosing Passivhaus is about getting more value in return.**

Furthermore, creative and considered design choices (informed by the PHPP) such as building form, orientation, and glazing can deliver efficiencies that balance out any extra investment. International experience, particularly in Germany, shows that with familiarity and scale, Passivhaus can be delivered at no extra cost, and in some cases even cheaper than conventional standards.[3]

At Oran, we are keen to help clients maximise their investments and reap as many benefits that Passivhaus can offer.

1 Passivhaus Benefits, Passivhaus Trust, 2021.

2 Passivhaus Construction Costs, Passivhaus Trust, 2019.

3 https://umweltbewusst-bauen.de/baukosten-wieviel-kostet-der-faktor-energieeffizienz-wirklich/

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Why Oran?

The Who

Oran: Passivhaus on a Larger Scale

While Passivhaus may sound more appropriate for smaller domestic projects given its name, it is equally applicable to larger schemes and can be applied to more complex commercial developments in the same way. At Oran Architecture, we are passionate about applying Passivhaus principles to large-scale developments, including hotels, multi-residential buildings and student accommodation. These projects benefit from the efficiency of compact layouts, repetitive designs, and integrated systems, making them ideal candidates for Passivhaus design.

We aim to guide clients through every step of the Passivhaus journey, delivering superior building performance and user comfort on a bigger scale. Together with clients and collaborators, we endeavour to make positive and meaningful additions to the built environment.

Let us help bring your large-scale projects to life with sustainable, high-performance Passivhaus design.

Hotels

Passivhaus design suits hotels with their constant heat loads from 24/7 occupancy and appliance use. Mechanical Ventilation with Heat Recovery (MVHR) systems ensure fresh air and energy efficiency by reusing thermal energy.

Service zoning is critical in hotel design, allowing for independent control of guest rooms and shared areas such as lobbies, event spaces, and restaurants. High hot water demand is a major operational consideration in hospitality and can typically be addressed through centralised, high-efficiency systems, often supported by solar thermal collectors or heat pump technology. Passivhaus design will hugely minimise the operational energy usage of a hotel, providing cost savings for hotel operators in the long run.

Multi-Residential Buildings

Passivhaus design is also a strong fit for apartment buildings, especially mid and high-rise developments. These developments naturally lend themselves to energy-efficient design due to their advantageous form factor and shared walls, which reduce the surface area through which heat can escape.

An optimised external envelope, utilising Passivhaus design, improves air-tightness and thermal performance, enhancing overall energy efficiency. Careful attention to window orientation and glazing specification can ensure generous day-lighting and access to quality views, without compromising thermal comfort. Occupants will benefit from quiet, draft-free living spaces with excellent indoor air quality and significantly reduced energy bills.

Student Accommodation

Student housing shares many similar advantages with both hotels and apartment buildings when it comes to Passivhaus design. These developments benefit from highly controlled internal environments that promote health, concentration, and well-being - key factors in student life.

Standardised room layouts allow for the efficient repetition of details and service cores, improving consistency and reducing the risk of performance gaps. Over time, the energy efficiencies translate into significant savings for educational institutions or operators. Prefabricated or modular construction methods can be advantageous in this context, enabling faster delivery, consistent detailing, and improved build quality, supporting the delivery of Passivhaus performance targets.

Oran: Looking Ahead in Scotland

"The Passivhaus equivalent policy offers a long-term 'spend to save' approach that will help address Scotland's fuel poverty crisis, help future-proof housing stock, and tackle our climate emergency."

Alex Rowley MSP

The Scottish Government has confirmed that new building regulations will introduce a **Passivhaus-equivalent standard across all new buildings** including non-domestic projects such as offices, schools, and community facilities.

The expected implementation date of the Passivhaus-equivalent standard is early 2028. Inevitably this will necessitate a requirement for training and support for industry professionals, including designers, contractors, and statutory authorities, all of whom will need to up-skill.

This means that future projects in Scotland will need to meet much higher standards of energy efficiency, comfort, and environmental performance, backed by stricter verification and quality assurance.

At Oran Architecture, we are poised to align with these upcoming requirements. With **certified Passivhaus expertise, we can help you pivot now**, embedding the right design strategies, energy modelling, and fabric performance into your projects today. This not only **ensures future compliance**, but also **delivers immediate benefits in comfort, operational savings, and asset value**.

By acting early, we are here to help clients stay ahead of regulation change, avoid costly redesigns, and create resilient, future-proof buildings.

For further information on how Oran Architecture can assist you in your Passivhaus projects and sustainability aspirations, please contact email@oranarchitecture.com

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