

# PASSIVHAUS

AUSTIN  
DESIGN  
WORKS

## WHAT IS PASSIVHAUS?

Passivhaus is a German construction standard founded in the early '90s, for **low energy buildings** with **high level of occupant comfort**.

Passivhaus buildings are designed with environmental principles and focusing on **'fabric first'**. This means that the initial investment is made on high quality building elements, designed with site specific climate parameters to consume the least energy possible.

The buildings are so well insulated and draught-proofed, that their annual space heating demand is so low that the conventional heating system can be omitted and supplied only by the ventilation system.

## HOW IS THIS ACHIEVED?

- ✓ Design modelling using the Passive House Planning Package (PHPP)
- ✓ Very high levels of insulation
- ✓ High-performance windows with insulated frames. These have to be located to allow solar gains in winter and will require shading in summer
- ✓ High levels of airtightness
- ✓ 'Thermal bridge free' construction
- ✓ Mechanical ventilation system with highly efficient heat recovery

## WHY PASSIVHAUS?

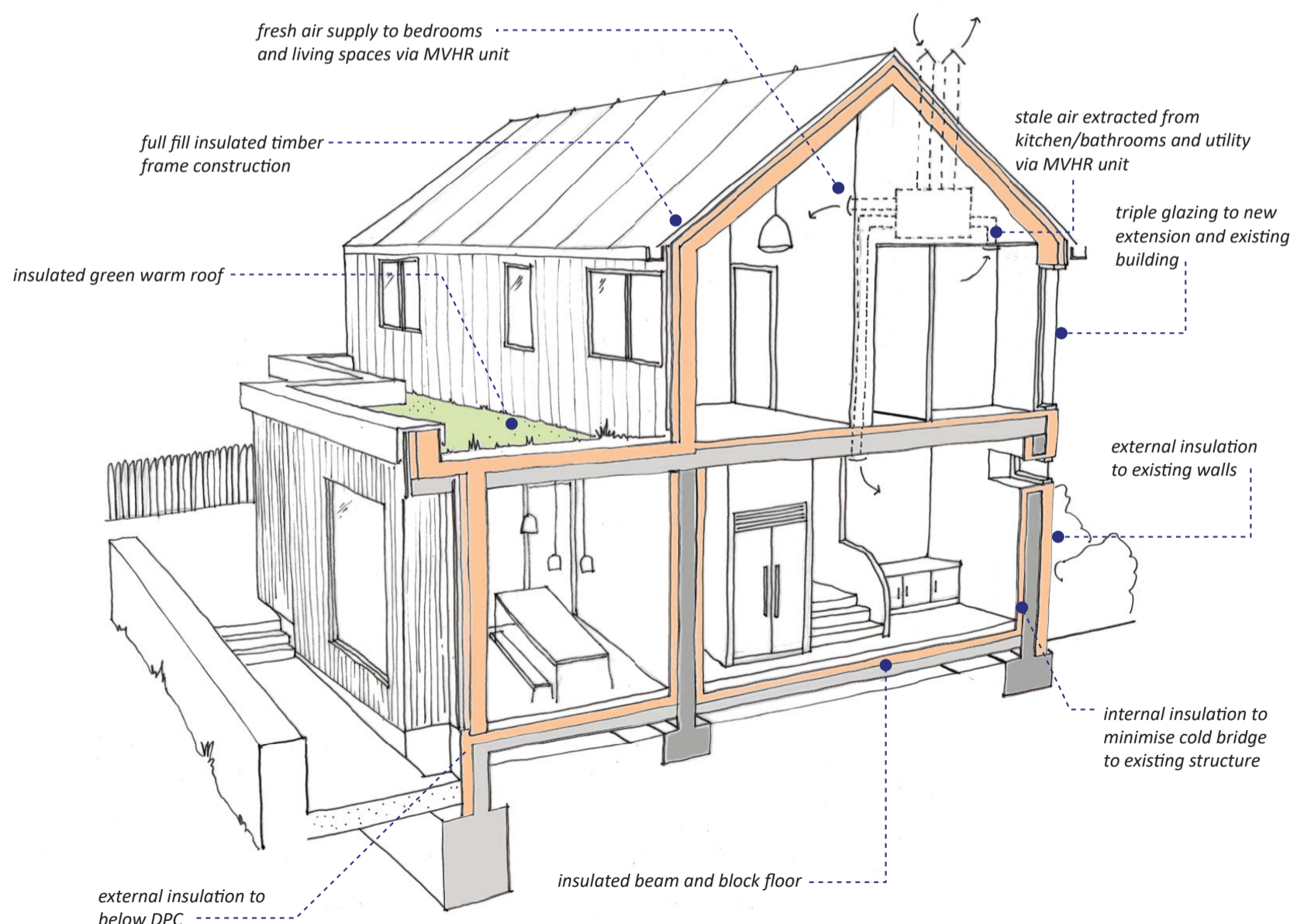
**IT SAVES ON RUNNING COSTS:** The heating demand of a Passivhaus is 75% less than standard practice for UK new build, providing long-term saving on heating and cooling bills.

**REDUCES CO2 EMISSIONS:** Passivhaus buildings help achieve 80% the carbon reductions through the reduced emissions.

**NO OVERHEATING:** Good air quality and comfortable temperatures all year round (20 °C in winter and 25 °C in summer).

**NO DRAUGHTS:** High levels of airtightness, with no awareness of air moving.

Passivhaus can also be applied to retrofit projects, achieving similar heating requirements.



# BUILDING STANDARDS



If you would like to find out more, please visit our website or contact us on **01453 836 393**

## WHAT ARE THEY AND WHAT DIFFERENCE DOES IT MAKE?

We understand that the building process can be overwhelming, with so many choices for In the UK, there are building regulations in place to ensure that all construction achieves specific requirements established by the government and approved by parliament but these are currently too low for energy efficient performance and comfort standards.

There are many other design & construction standards with improved energy performance targets. What does this mean and why should you invest money on these?

The UK government has developed the Building Regulations to dictate a **minimum** design and construction standard for all buildings. The regulations are made accessible via the Approved Documents which give guidance on how to achieve these **minimum** requirements.

Below is a chart showing the final energy use per m<sup>2</sup> in a new building designed in accordance with common construction standards in the UK. These standards vary due to the difference in their design and construction approach. The graph below shows that there are incremental differences in the final energy output, however the biggest difference is in the **heating demands**.

## WHAT DOES THIS MEAN?

By investing in improved building fabric, air tightness, higher quality materials, design and construction workmanship this means that the amount of energy required to heat the building is reduced (lowering energy bills).

## HOW?

All of the standards in the graph show varying levels and quality of building fabric, however the main difference lies in the standards to the right of the green line. These standards involve a **more rigorous design approach**, taking into account environmental factors and modelling the design in the Passive House Planning Package (PHPP).

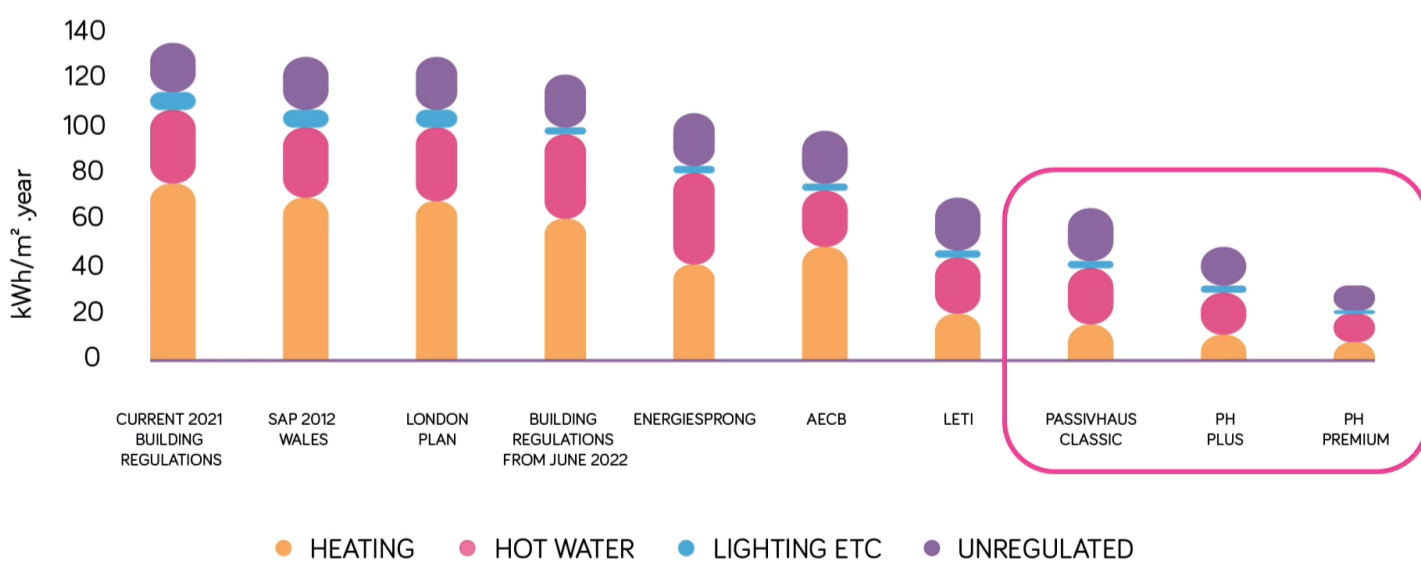
They have different (and stricter) targets for airtightness, heating and cooling demand, primary energy demands, thermal bridge allowance and overheating, requiring more design scrutiny in the early stages.

These standards also require impartial and external certifiers to ensure that the design and construction meet the criteria. This means that there is less room for error, and gives greater certainty of achieving the required outcome.

## BENEFITS:

- ✓ Long term saving on bills
- ✓ Reduced carbon emissions
- ✓ Improved market value of the property
- ✓ Impartial certification process provides product guarantee
- ✓ High quality construction lasts longer

Final Energy per m2 by end use (including Performance Gap)



Extracted from "Design Performance for Climate Action" by Coaction



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04622286