



Quality Control

## Design & on-site sequencing and training



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I want to use a(n) \_\_\_\_\_ design and construction process.

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An O \_\_\_\_\_ of P \_\_\_\_\_ is worth one P \_\_\_\_\_ of C \_\_\_\_\_.

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Why shouldn't Passivhaus be treated like cake decoration?



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What lies at the heart of a successful Passivhaus?  
A R \_\_\_\_\_ brief.

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Even the finest and rarest ingredients won't make our dish tasty unless:

- \_\_\_\_\_  
\_\_\_\_\_
- \_\_\_\_\_  
\_\_\_\_\_

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## What are the seven secret ingredients in the Passivhaus recipe?

## 'Passivhaus Principles'

### Discussion

- What would you leave out?
  - MVHR?
  - 0.6 airtightness target?
  - Superinsulation?
  - Thermal bridge free construction?
  - Quality assurance?
  - Quality windows and doors and triple glazing?
  - Energy modeling with PHPP – use intuition?
  - Certification?
  - Anything else?

## PassivHaus Standard: Definition

The term 'PassivHaus Standard' (or Passive House) refers \_\_\_\_\_.

The standard utilises \_\_\_\_\_ based approach.

Third party \_\_\_\_\_ is recommended.

Buildings designed to this standard have been demonstrated to \_\_\_\_\_ as \_\_\_\_\_.

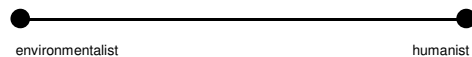


PassivHaus: The Pilot Building Darmstadt 1991



## Environmentalism, or humanism?

Where does Passivhaus sit on this scale?



*Would you like control over your ventilation, or would you rather leave it to chance?*

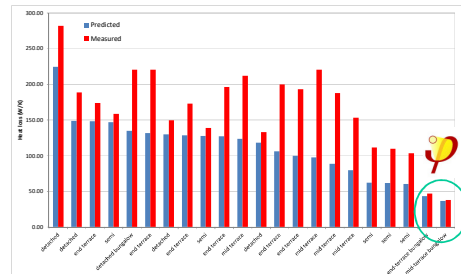
## Control strategy: Window Ventilation

What does research say about the success of window ventilation and trickle ventilation?

### Ventilation strategy: Mechanical Ventilation

What does research say about the success of mechanical ventilation?

### Performance not box ticking



Measured versus predicted heat loss coefficients  
22 dwellings from the Leeds Met Coheating database

*“\_\_\_\_\_ are the crash-test dummies of the design world” ... SAM CASSELS*

### Principles Schminciples

Clear & easily verifiable

- blower door
- thermography
- PHPP
- components

Trades description

- fake goods
- consumer law
- annoys those doing it properly



Claiming The Passivhaus Standard  
free download: [www.passivhaus.org.uk](http://www.passivhaus.org.uk)

### How is Quality Assurance, good Supervision and relevant Training attained.



### What Contract works best?

**Traditional** – Full supervising officer ie architect, full specification/bill of quantities, competitive tendering.....

**Design and Build** – Main Contractor takes responsibility for design and the total build process.

**Project Management** – where the project management team work directly for the client managing design on site, contractors, suppliers, finance.....

All can work, All can have difficulties.

**Cooperation is far more important.....and strong leadership.**



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**Quality Assurance also stems from a good buildable design.**

**“Failure in a Passivhaus is attributable to  
\_\_\_ % design,  
\_\_\_ % site execution”**



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**Chinese whispers, training value can be diluted.**

The smaller the job the easier to supervise.....obvious.

Smaller builders tend to be multi traded and have continuity of in-house personnel, less lines of communication.

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**Chinese whispers, training value can be diluted.**

With larger contracts questions are-

- Proportion of in-house labour
- Training regime
- Management of sub contractors
- Managing of the turn-over of personnel

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**Who carries the can?**

What happens when the air pressure target is not met?

The builders fault?

The designers fault?

Financial penalties?

Fall backs – AECB Silver, AECB Carbonlite Retrofit?



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**Who is in control of Quality?**

Client?  
Supervising Architect?  
Project manager?  
Builder?  
Clerk of works?  
Is an air tightness champion a good idea?



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## Who is in control of Quality?

### Required for PH certification

- Photographs throughout the build to demonstrate the build was as designed
- Product delivery notes
- Airtightness certificate
- Ventilation commissioning & other plant commissioning
- Details of any changes
- Site Forman's declaration



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## Training proud builders.

What I say:

- We are building on your expertise.
- Most of us have built badly at some time.
- No one likes doing a bad job as long they're respected and paid properly.
- Everyone on the team is as important as anyone else.
- Ask questions. It's good to talk!

- Try and engender a 'no blame culture'

- 0.6 air changes/hr is the equivalent of a 20p piece hole in 5m<sup>2</sup> of the envelope

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The UK Passive House Organisation

## Training for site



A programme of tool box talks engenders:

- support between trades
- thinking ahead..... 'how will we tape that'
- treatment of air tightness result as a matter of pride
- a well organised and tidy site improving build quality
- when air tightness taping, listening to Radio 3 and leaving mobile phone in the van



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## A suppliers tale

- Windows take 10 weeks from point of order not the enquiry!
- Long term partnership with designers and builders gives the supplier confidence to invest in research and development
- Suppliers can help with design to achieve true value engineering if they've a good chance of the job coming their way
- Contractor estimators and buyers can play one supplier off against another.....usually leading to trouble.
- Easier if client/architect nominates the supplier.
- Windows are the most expensive and complicated component of a Passivhaus, things go wrong!
- Partnership

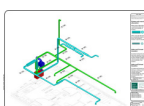
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## You can't cut corners with MVHR

A good MVHR design should:

- **Advice on the right MVHR system** for your specific needs and budget
- **Noise minimisation** through careful positioning of attenuation
- **Careful positioning of ducting**, modelling for pressure loss and sound attenuation
- **Air flow calculations** provided for building control
- **Technical support** including telephone support to installers
- **Optional Commissioning Service** setting the system to run to designed flow rates and offering extra quality control (results given to certifier)



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## The elephant in the room.

- Does the client get value for their money
- Who takes the financial risk – client, main contractor, sub contractors, or a mix
- Fixed priced contracts when the contractor inexperienced can lead to over-pricing or under-pricing
- Try to design within the comfort zone of the contractor
- Consider a partnership arrangement to share risk
- Benefits if contractor is involved in detailing, gives a different angle, allows ownership and more realistic pricing
- Keep the design simple and buildable

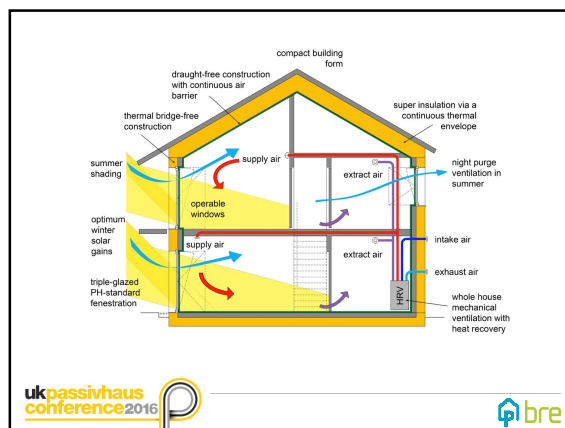
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*S\_\_\_\_\_ing and  
P\_\_\_\_\_ing are often  
overlooked aspects of  
design.*

Passivhaus:

What makes it tick?



6 things to get right

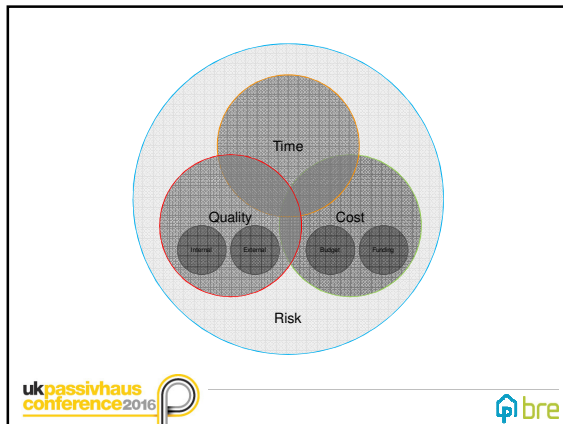
1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_



What's the fundamental tool NO  
Passivhaus can be without from  
day one?

\_\_\_\_\_

\_\_\_\_\_



When it comes to risk management, what's the greatest challenge?

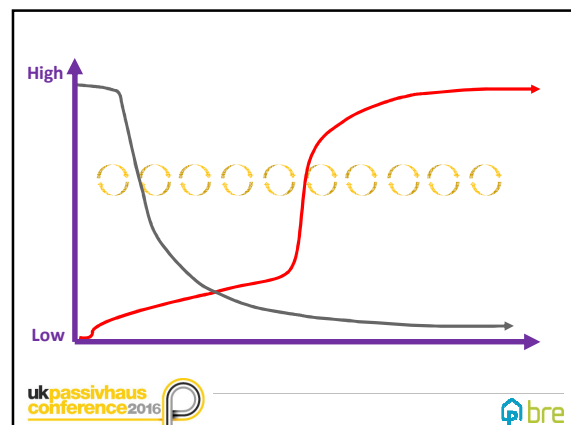
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When is the best time to design out risk cost effectively?

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## QA

- Engage everyone as early as possible
  - Value Engineer from day one
  - Get an experienced team
  - Earning respect and sharing reasonability
  - Design and build – what's the right way?
  - Contracts - Don't split up the CD collection!
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## Any questions?

For more information about Passivhaus ideas, concepts and technologies go to:

[www.GreenBuildingStore.co.uk](http://www.GreenBuildingStore.co.uk)

[www.BuildingPerformanceEvaluation.com](http://www.BuildingPerformanceEvaluation.com)

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