NBT

Natural
Building
Technologies

Believe
in better
buildings

Innovating with Low Impact Products

Enterprise Centre UEA

NBT Natural Building Technologies

NBT is a leading distributer of insulation solutions that deliver; thermal, moisture and overheating control

Ponteland First School

What is the Challenge?

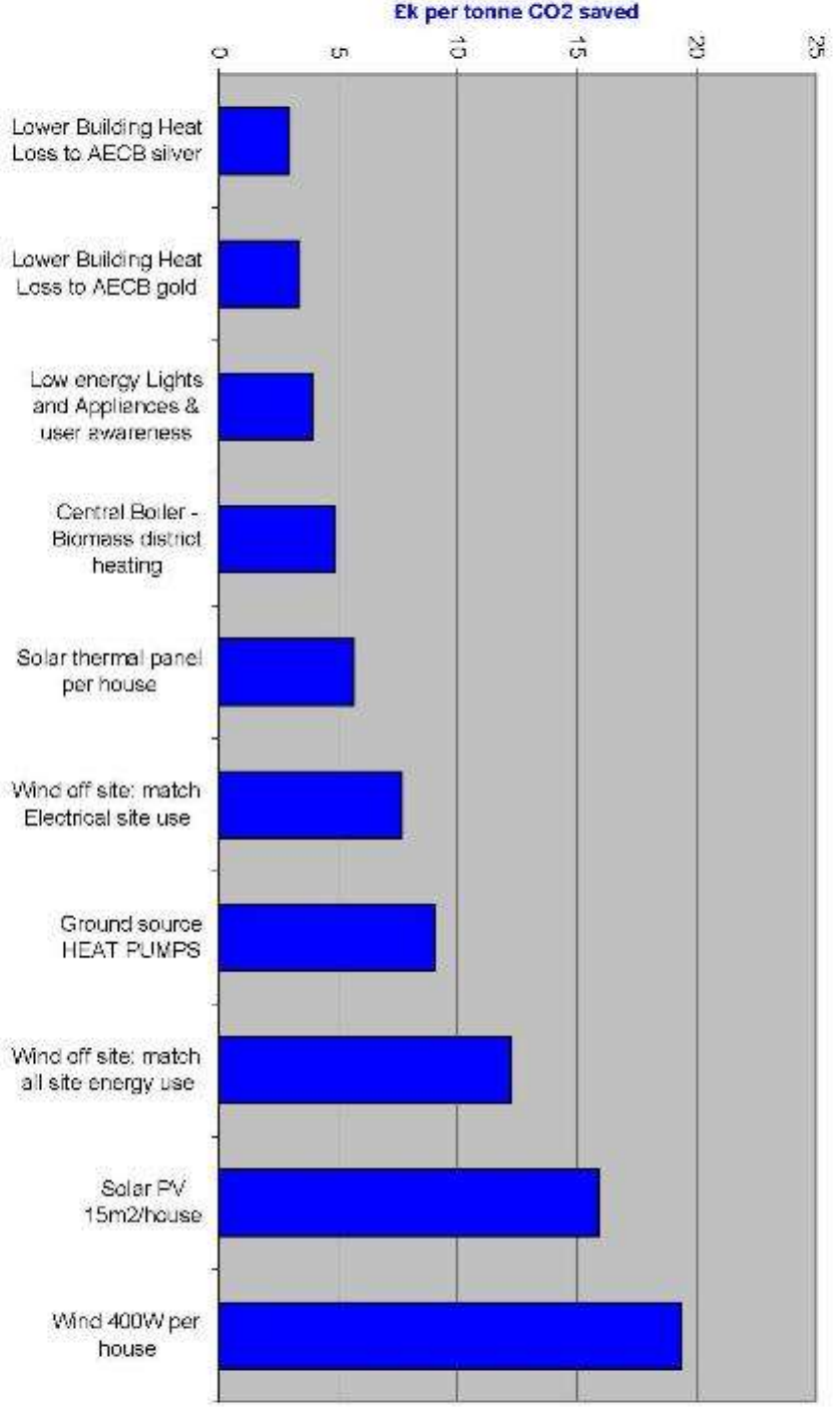
Baldwyn Primary School

Drives

1. Rising energy costs

2. Legislation

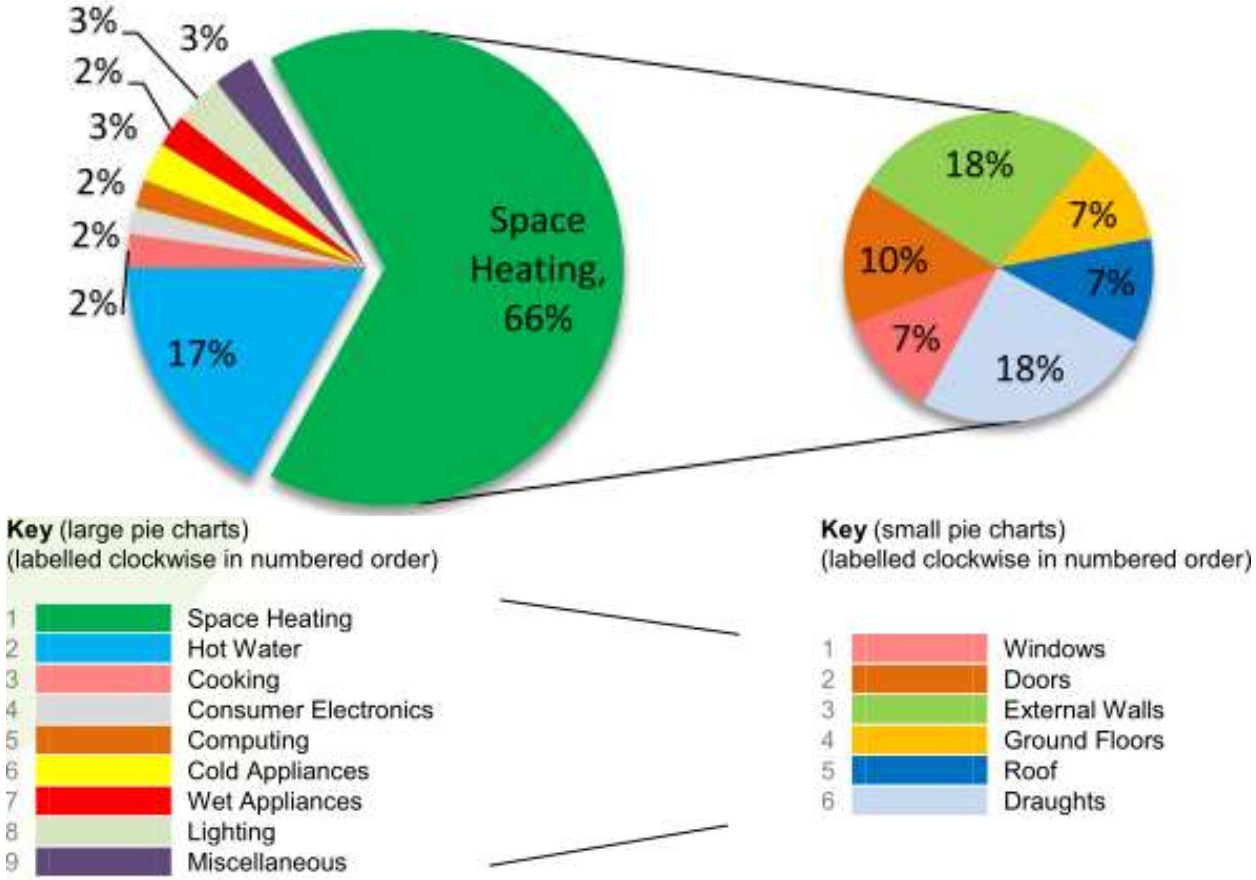
St Austell Energy Analysis



NBT

nbt consult™

Average UK Energy Use

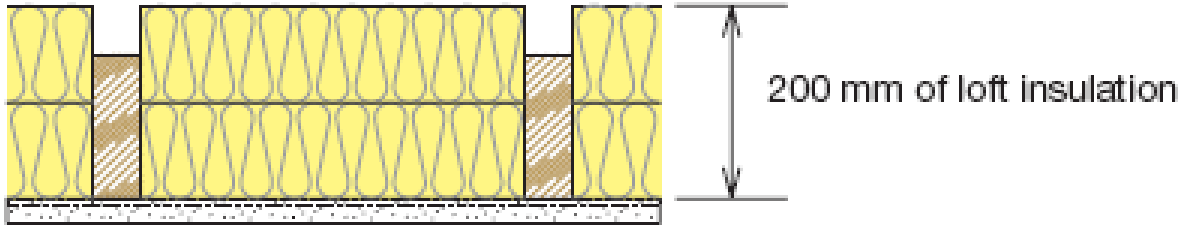


Essential Principles

- Thermal Performance
- Breathability
- Overheating Control

Repeating linear thermal bridges

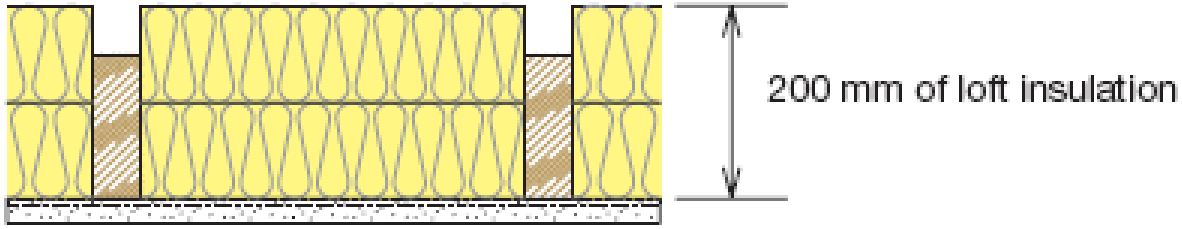
Changing U-values



U insulation	= 0.18
U proportional	= 0.20 (thermal bridging of joists taken into account)
U combined	= 0.24 (gap above joist taken into account)
	= 33% (increase in U-value)

Repeating linear thermal bridges

Changing U-values



U insulation	= 0.18
U proportional	= 0.20 (thermal bridging of joists taken into account)
U combined	= 0.24 (gap above joist taken into account)
	= 33% (increase in U-value)

More seriously calculations can include;

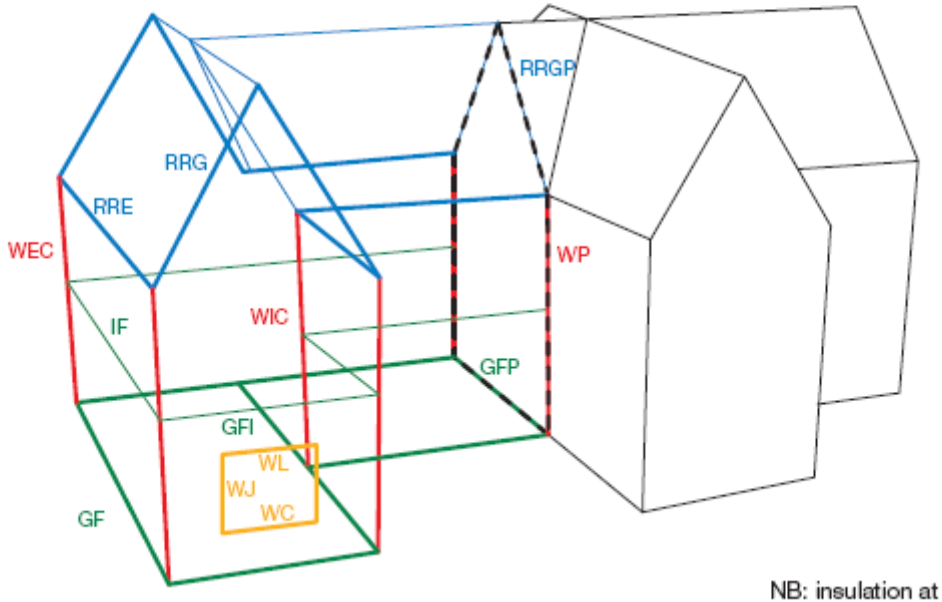
incorrect ration of timber to insulation
incorrect k-values
ventilated cavities classed as unventilated

y-values

y-value – a notional additional U-value, spread uniformly over the whole thermal envelope.

Non-repeating linear thermal bridges

- GF – ground floor to wall
- GFP – ground floor to party wall
- IF – intermediate wall to floor
- RRE – roof rafter at eaves
- RRG – roof rafter at gable
- RRGP – Roof to party wall
- RRGF – roof to party wall at gable end
- WL – window to wall at lintel
- WJ – window to wall at jamb
- WC – window to wall at cill
- WEC – wall external corner
- WIC – wall internal corner
- WP – external wall to party wall



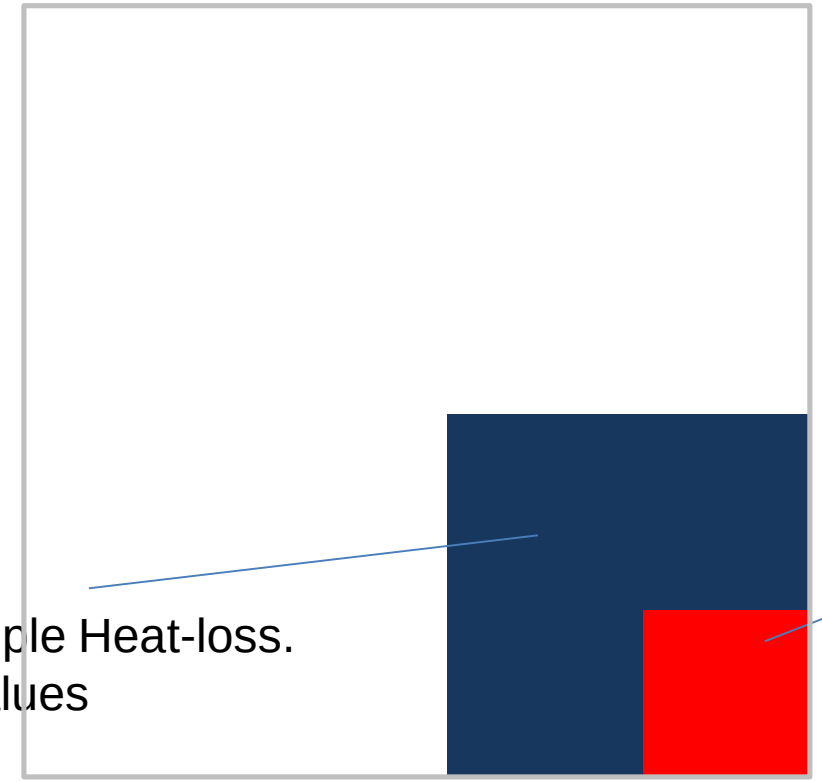
NB: insulation at RAFTER level

Typical UK Building Stock

Principle Heat-loss.
u - values

Heat loss through
non repeating
thermal bridging
y - values

UK Building Stock Part L 2010

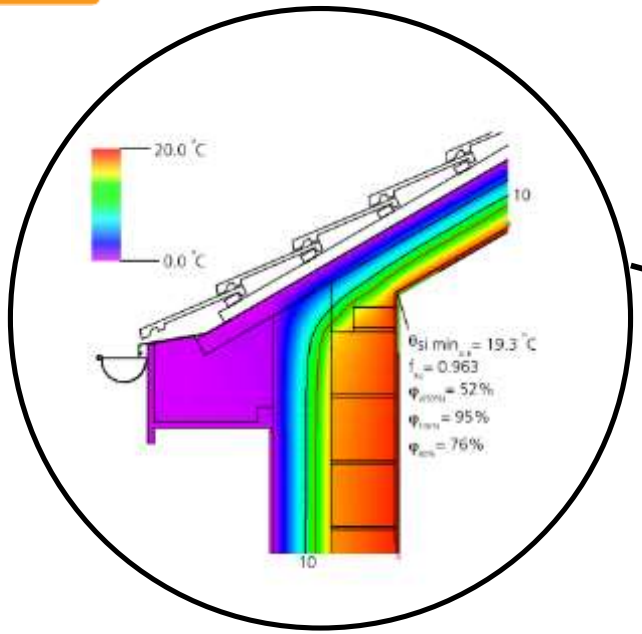


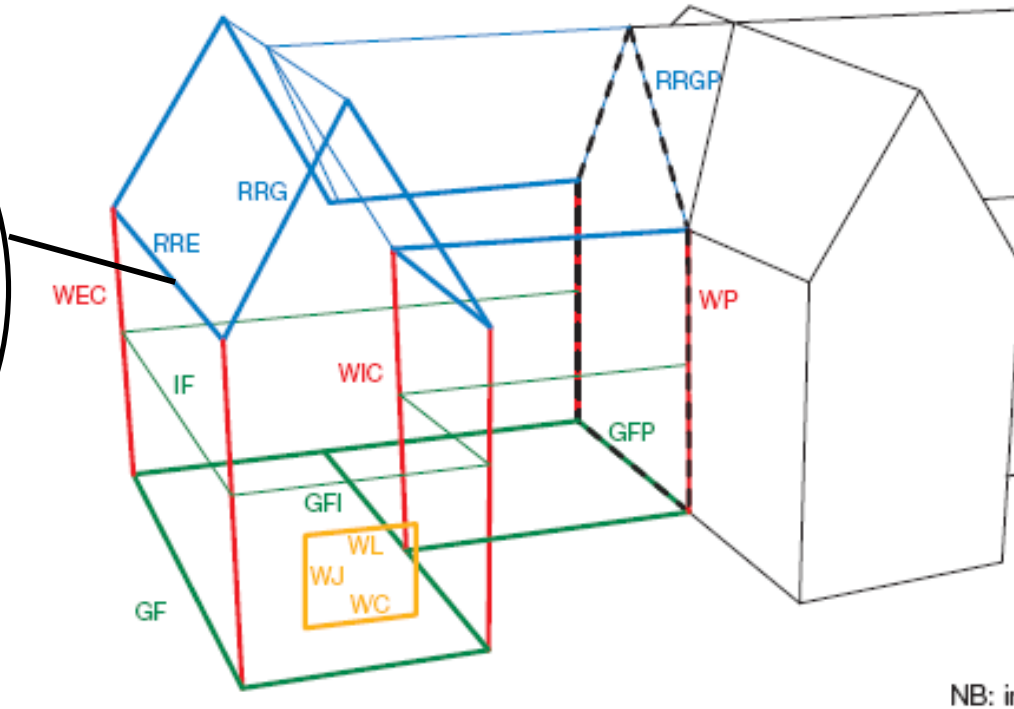
Heat loss through
non repeating
thermal bridging
y - values

Principle Heat-loss.
u - values

NBT Natural Building Technologies

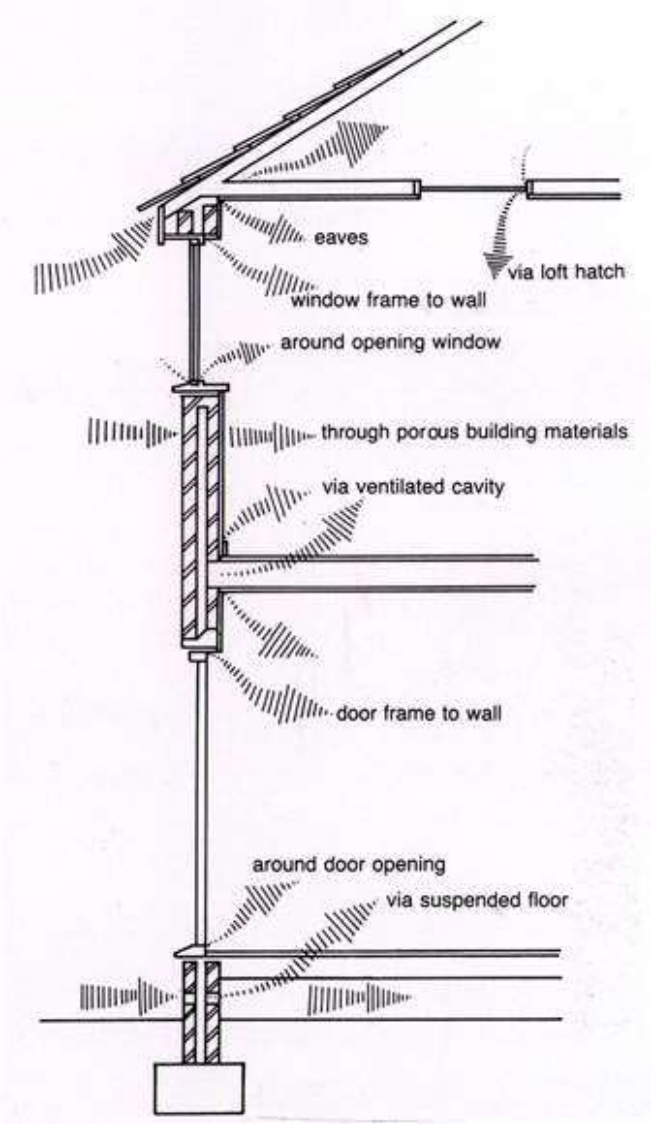
Calculating y-values



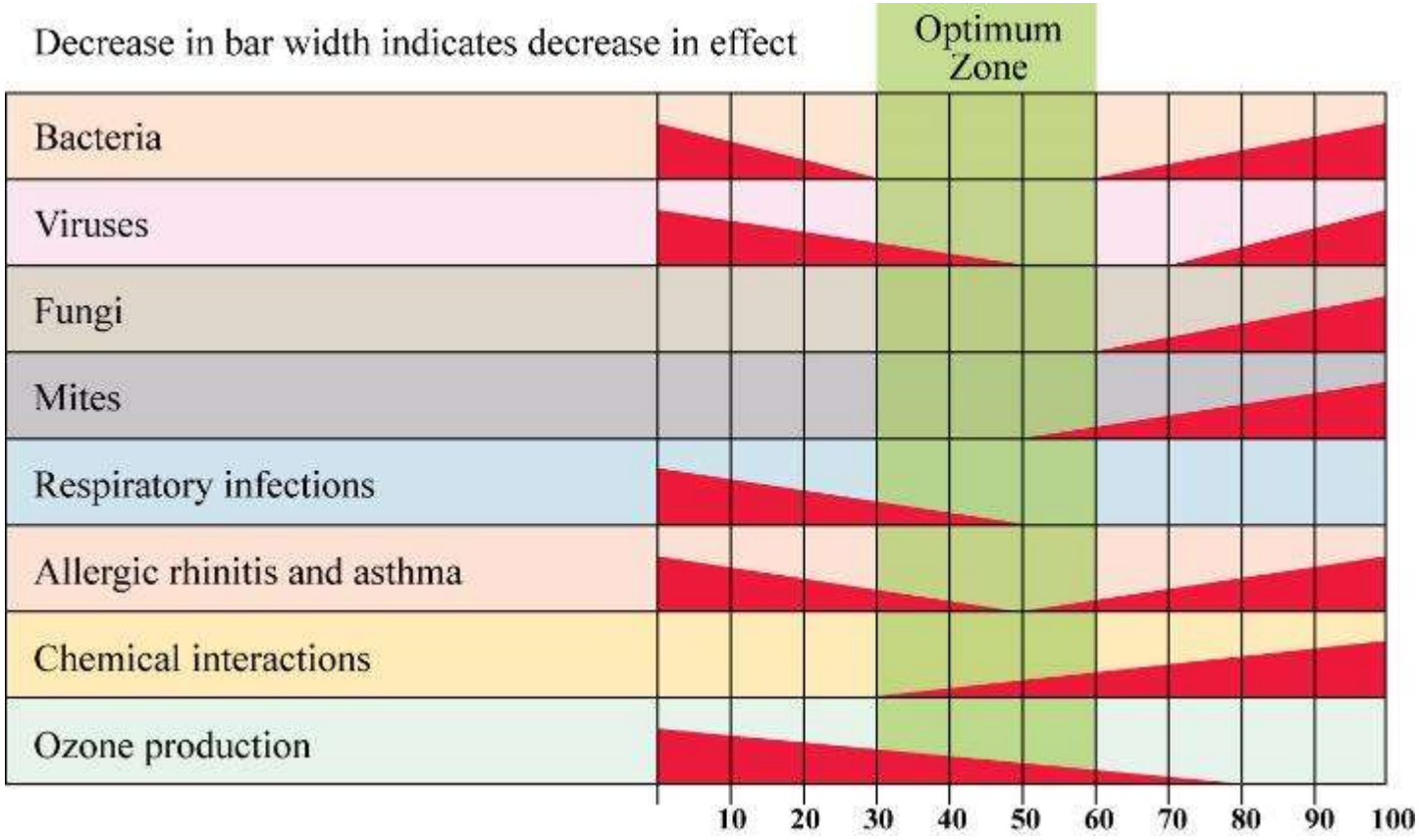


NB: i

Air tightness



Relative Humidity Control



Additional dynamics

Keeping a building warm in the winter months using very little energy is relatively simple.

The Larch House UK's 1st affordable Passivhaus

Essential Principles

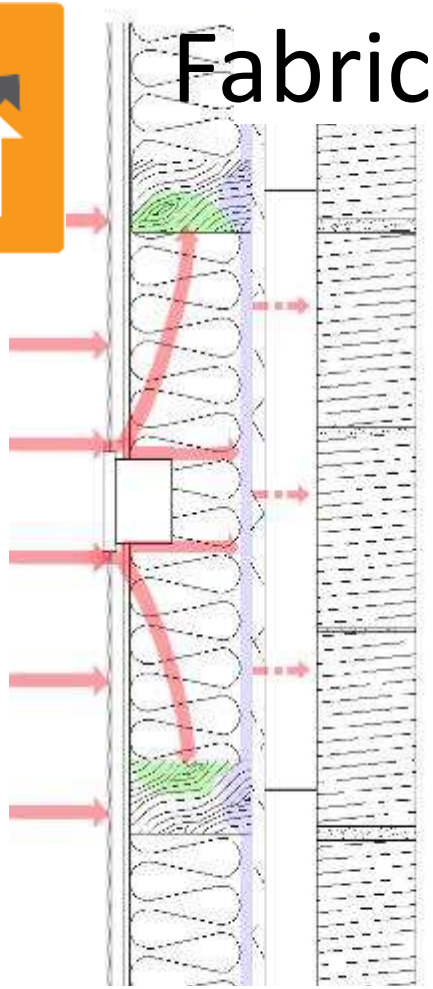
- Thermal Performance
- Breathability
- Overheating Control

Pavatex **outperforms** any synthetic insulation. No other insulation will **breathe, wick moisture** and regulate building temperature, both in the summer as well as the winter.

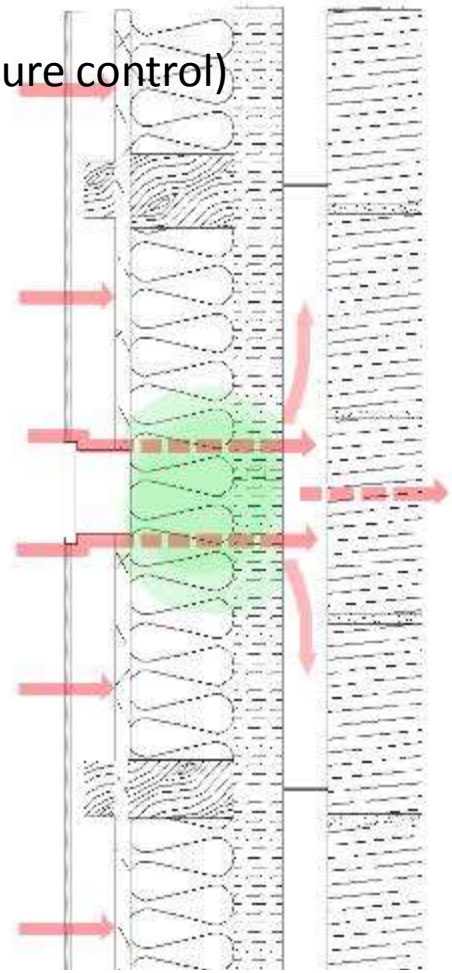
Add to this the fact that it is **100% natural** and locks up more Carbon than is used to produce or transport it, combined.

NBT Natural Building Technologies

Fabric durability(moisture control)



Vapour check based system



Vapour open system

8mm Meshed BAUMIT BAYOSAN
External Render

PAVATEX DIFFUTHERM woodfibre board

EJOT insulation fixing

Timber Stud

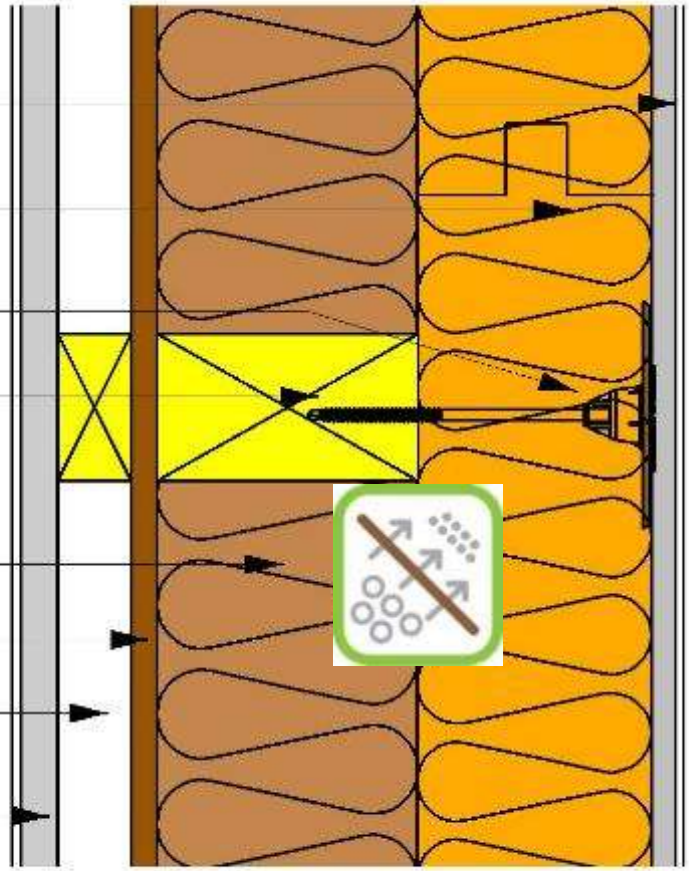
PAVAFLEX

WARMCELL, ISONAT (Hemp/Cotton) or
Sheepwool Insulation

OSB (Racking & Air Tightness) 9mm / 11mm

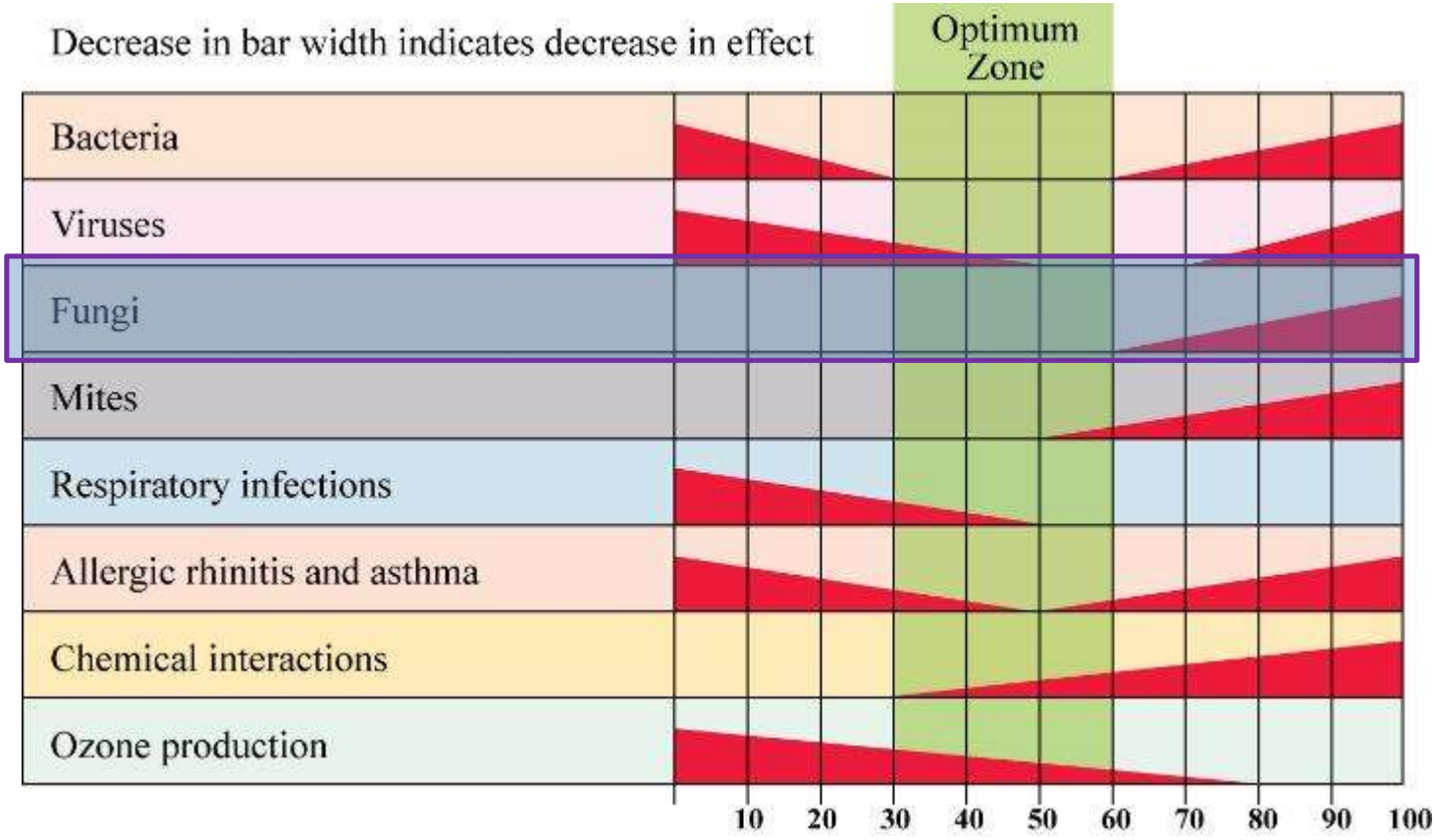
Service Void 25mm

Plasterboard 12.5mm with skim
and NBT emulsion paint



Inside **Outside**

Relative Humidity Control



Rot-riddled homes cost builder dear

It seemed like such a good idea at the time, building an award-winning housing estate with a bargain price-tag, but eight years on Taylor Wimpey's dreams of prestige and prizes have turned into a £12 million headache (Kathryn Hopkins writes).

And it all started so promisingly, too. John Prescott, then the deputy prime minister, launched a competition to produce low-cost, energy-efficient homes and the High Wycombe-based builder won. Rogers Stirk Harbour + Partners, Lord Rogers of Riverside's architectural practice, designed 122 houses for a site in Milton Keynes that would cost £60,000 — a relatively cheap price even then — and a year later the estate won the Royal Institute of British Architects' Mauser Medal for best new homes.

Since then, though, the good news has tailed off significantly. The houses described in the Wimpey sales brochure as a "truly innovative and outstanding development of sustainable homes" became riddled with damp and rot after cladding panels fell off.

According to a report commissioned by the housebuilder: "There is likely to be wet and dry rot and fungal infestation behind the rainscreen of each dwelling, due to poor detailing and poor construction."

In October, a resident called Paul wrote on the *Oxley Woods Living* blog: "We. . . from first-time buyers, to families, to retirees, are in a terrible situation. We personally fear we may have lost all that we have put in to our homes — the huge financial investment, but also the time, energy and love spent making the houses our homes an this estate an enviabl open and welcoming community."

Taylor Wimpey must spend millions repairing rot at Oxley Woods, designed by Lord Rogers of Riverside's practice

Taylor Wimpey set aside £12.4 million in provisions at the end 2014, compared with £100,000 the previo year, according to it annual report. Most this will go towards repair work on the Woods homes.

Cue the legal bat The company is see £5 million in damag from Rogers Stirk Harbour + Partner Wood Newton Developments, wh went into liquidat four years ago, an Coxbench Manufacturing. legal proceeding ongoing. RSH sa October that it "defend the clai vigorously".

Overall, the p something of a blip for a comp built 6 per cent homes last yea 2013, with the price up 12 per £213,000. It en year with net £113 million.

Vivendi s

houses our homes and this estate an enviably open and welcoming community."

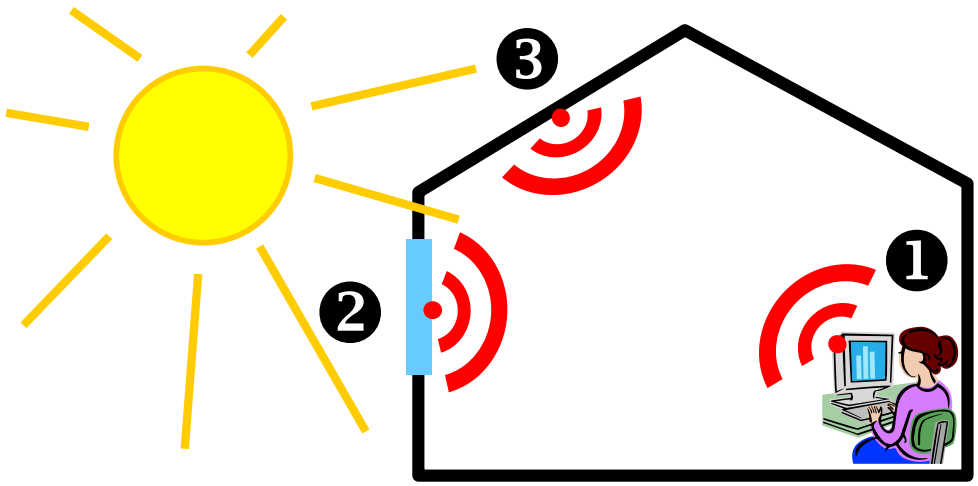
Taylor Wimpey set aside £12.4 million in provisions at the end of 2014, compared with £100,000 the previous year, according to its annual report. Most of this will go towards repair work on the Oxley Woods homes.

Cue the legal battles. The company is seeking £5 million in damages from Rogers Stirk Harbour + Partners, Wood Newton Developments, which went into liquidation four years ago, and Coxbench Manufacturing. The legal proceedings are ongoing. RSH said in October that it would "defend the claim vigorously".

Overall, the problem is

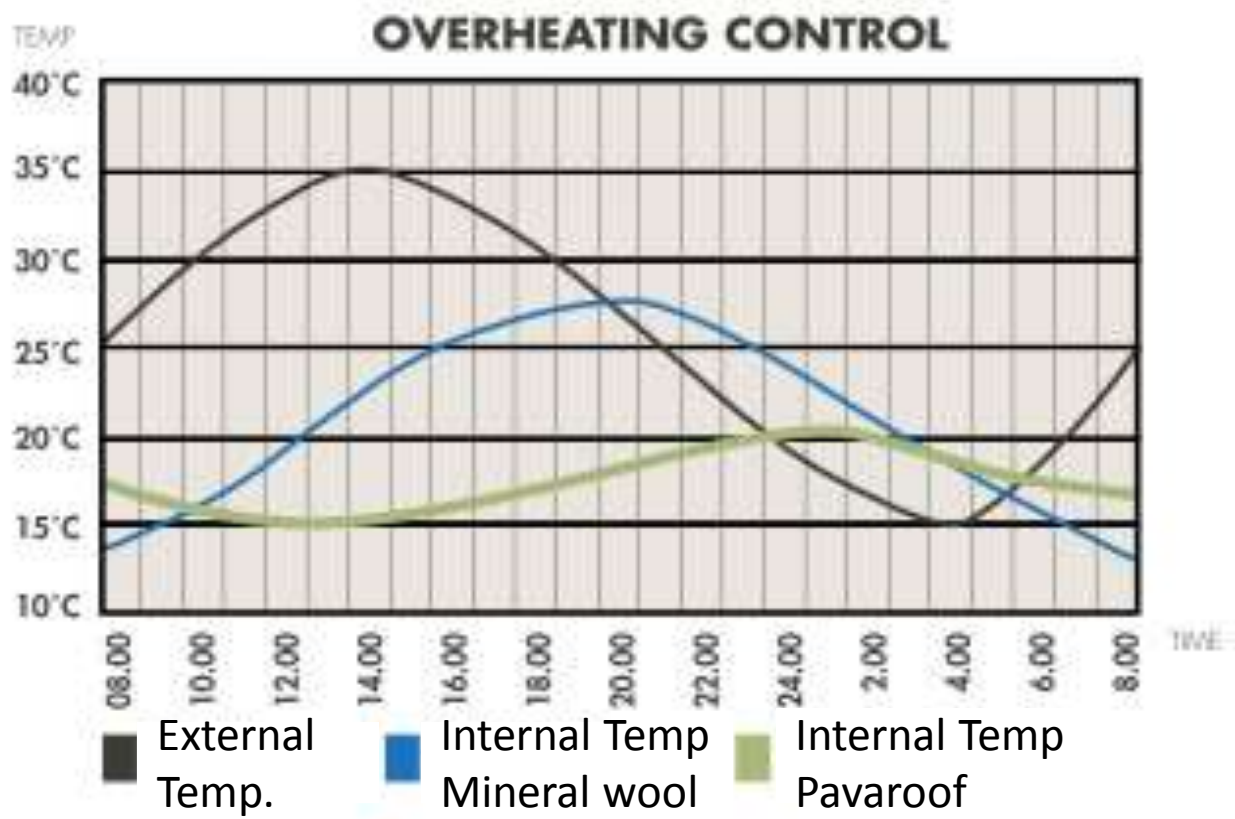
Overheating Control

3. Heat passing directly through the walls.



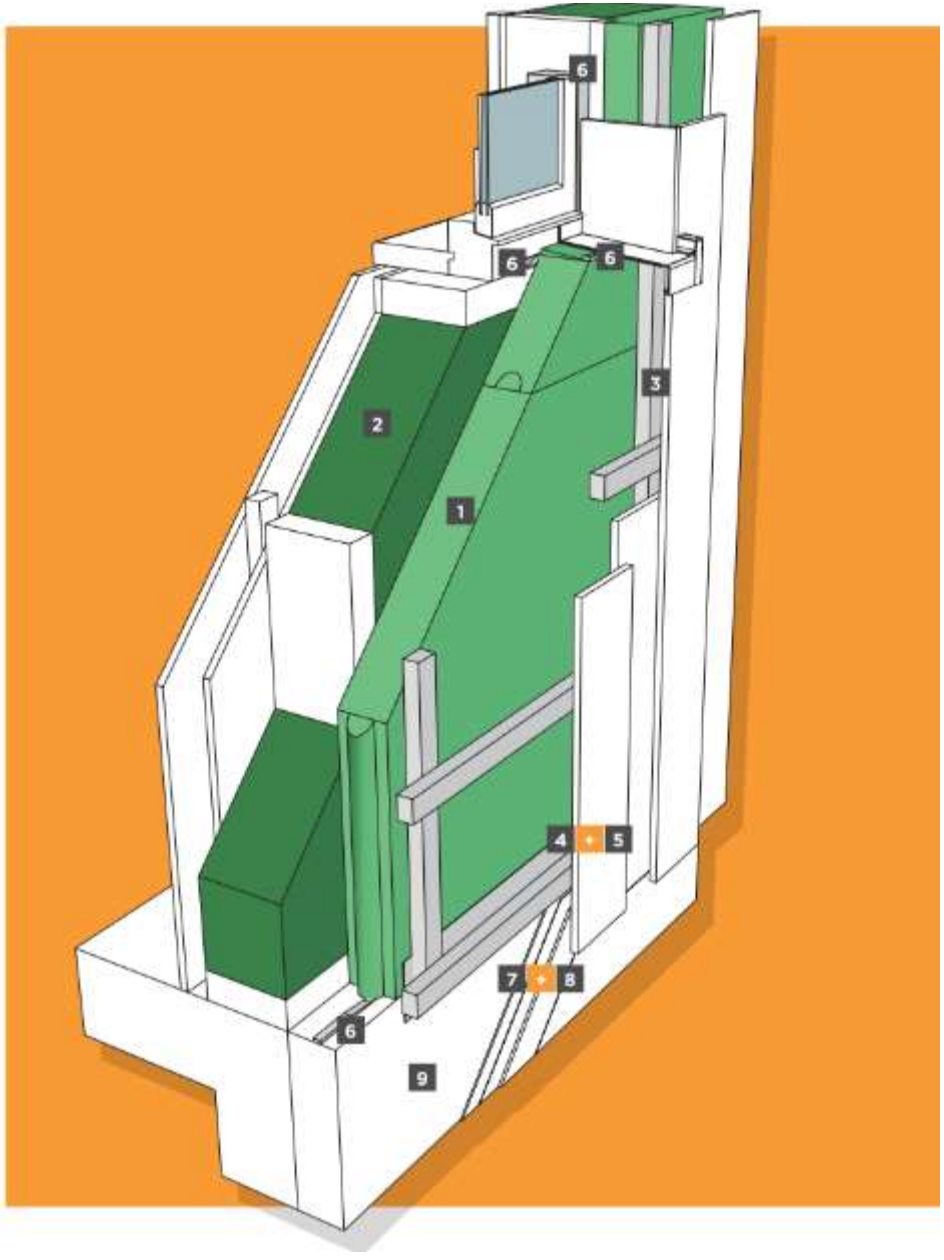
Decrement Delay

Is about thermal conductivity not just thermal mass.


OVERHEATING CONTROL
TEMP
40°C
35°C
30°C
25°C
20°C
15°C
10°C
08.00
10.00
12.00
14.00
16.00
18.00
20.00
22.00
24.00
2.00
4.00
6.00
8.00
TIME
External Temp.
Internal Temp Mineral wool
Internal Temp Pavaroof

NBT Natural Building Technologies

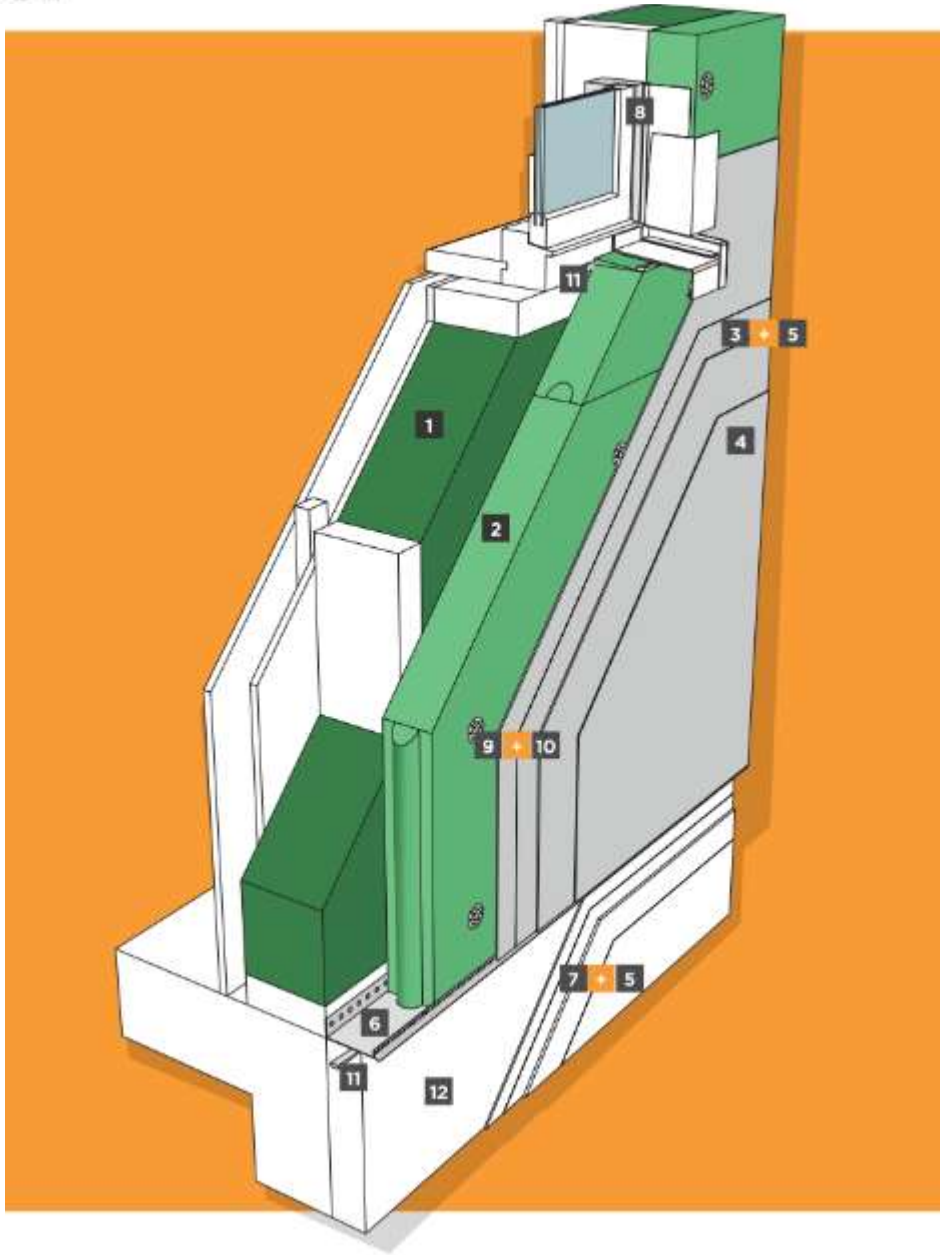
System for Timber Frame Clad



NBT Natural Building Technologies

NBT Natural Building Technologies

System for Timber Frame
Render



NBT Natural Building Technologies

NBT
System for
Timber Frame

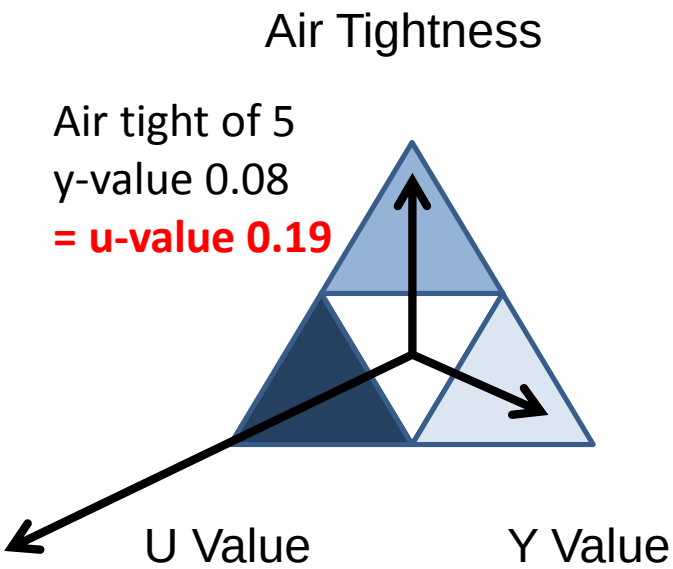
NBT
System for
Timber Frame

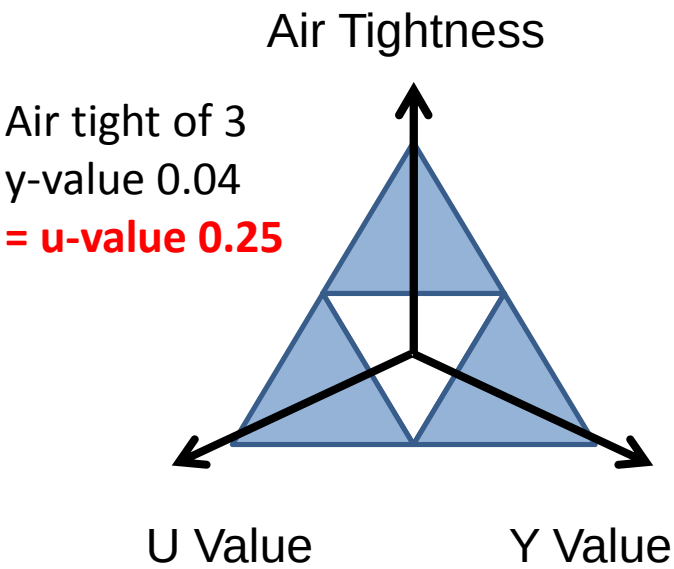
Cost Innovation!

Building Regulations
Approved Document Part L: ‘Conservation of fuel and power'

- U-values
- Y-values
- Air-tightness

Performance of the shell by NBT





Rather than focusing on U Values, NBT can provide your SAP and SBEM, or work with your Assessor, to develop a balanced approach to the performance of the fabric, saving money and delivering a more robust long term solution.

NB the example above is indicative and can vary

Simple Solutions for a Complex Problem

www.natural-building.co.uk

NBT Natural Building Technologies